



**U.S. Army
Corps of Engineers**
New England District
Concord, Massachusetts



**U.S. Environmental
Protection Agency**
New England Region
Boston, Massachusetts

PRE vs. POST REMEDIATION HEC-RAS MODELING & FLOOD STORAGE CAPACITY REPORT 1.5 MILE REMOVAL REACH GENERAL ELECTRIC (GE)- PITTSFIELD/HOUSATONIC RIVER SITE

**DCN: GE-031808-ADUO
March 2008**

Contract No. DACW33-00-D-0006



INTRODUCTION

This document summarizes the development of various phases of the HEC-RAS model as part of the design process for the 1.5 Mile Removal Action, the final model development incorporating post-remediation conditions, and the final flood storage capacity (FSC) calculations for post-remediation conditions.

HEC-RAS MODEL DEVELOPMENT

The HEC-RAS model was first developed as part of the Phase I design for the 1.5 Mile Reach. The first model used was based upon modeling work completed by General Electric as part of the Upper ½-Mile Reach Removal Action design phase. Development of the initial model for the 1.5 Mile Removal Action representing pre-remediation conditions from Lyman Street to Elm Street is documented in the *Final Basis of Design* for Phase I (WESTON, 2002). Subsequent phases were added to the initial pre-remediation conditions as part of each design and documented in each respective Basis of Design document (WESTON, 2005 and WESTON, 2006). For each phase, a field survey was conducted documenting pre-remediation conditions as part of various remedial designs. Each field survey documented in- and out-of-river vegetation, man-made structures, and riverbed substrate in the form of notes and Manning's n-values based upon standard published values.

Geometry for pre-remediation cross-sections was based upon the United States (U.S.) Army Corps of Engineers original riverbank-to-riverbank survey of the 1.5 Mile Reach in 1998, a topographic survey generated from aerial photography in 2000 and U.S. Geological Survey topographic information. Cross-sections were developed at transects approximately every 50 feet, with additional transects developed near bridges (See Figures 1A through 1C).

The results of the pre-remediation modeling served as a baseline against which comparisons to design simulated conditions would be made. Design conditions (geometry and n-values) were developed and put into the model. Model runs documenting the anticipated effects of the proposed design are presented in the Basis of Design documents and the following three reports:

- *Supplemental Design Information for Phase 1/Phase 2 Transition Area of the 1.5 Mile Reach Removal Action*, June 2003.
- *Supplemental Design Information for Phase 2 –Elm Street to Dawes Avenue of the 1.5 Mile Reach Removal Action*, March 2004.
- *Supplemental Design Information for Phase 3 –Dawes Avenue to the Confluence of the 1.5 Mile Reach Removal Action*, March 2005.

The objective of this analysis was to determine if the proposed designs would result in significant water surface elevation increases or velocity increases within the 100-year floodplain and to provide parameters for use in the design to evaluate and select appropriate engineering materials to mitigate any erosive impacts on the river channel and riverbanks. This analysis, as documented in the above-referenced three reports, showed no significant increase in water surface elevations or velocities within the 100-year floodplain.

The final step in the HEC-RAS modeling process is to compare actual post-remediation “as-built” conditions to the pre-remediation baseline conditions previously developed during the design process.

HEC-RAS MODEL INPUT

As indicated above and documented in the Basis of Design documents, pre-remediation conditions were developed based upon field observations and appropriately selected n-values. For design and post-remediation conditions, pre-existing n-values were used except where the river channel was modified with hard armor [riprap or articulating concrete block (ACB)] and where out-of-river areas were modified. Use of pre-remediation n-values in re-vegetated areas is based on eventual re-establishment of trees and vegetation on and above the riverbanks consistent with pre-remediation growth.

For out-of-river changes to pre-remediation conditions, published n-values were used for the various types of finished surfaces represented on the as-built drawings completed by Hill-Engineers, Architects, Planners, Inc. (Hill). Finished surfaces encountered included gravel roads, grass fields, re-vegetated areas, and paved areas.

For riprap, which represents a large majority of the hard armor within the river channel, Manning’s n-values for channel and lower riverbank as-built conditions were based upon the following formula:

$$n = y^{1/6} / [21.6 \log_{10} (y/d_{50}) + 14]$$

where y = depth of flow (ft) and d_{50} = riprap size (ft)

The depths of flow vary from station to station throughout the modeling area. Similar n-values were used for bridge to bridge areas or areas with the same size riprap. Three different d_{50} riprap sizes were used in the modeling area based upon 9-inch, 12-inch, and 18-inch riprap. This resulted in Manning’s n-values of 0.033 from Stations 500+00 to 514+00 (Phase 1) and 0.037 to 0.045 for the Transition Area (Station 514+00 to the Elm Street Bridge) for the lower riverbanks and channel. Within the Transition Area, 18-inch riprap was modeled for the 1H:1V sloped sheetpile wall covering and the areas from the edge of river up to the vegetative cover.

For Phase 2, from the Elm Street Bridge to Station 524+50, n-values of 0.025 were used, representing the ACB. From Station 524+50 to the Dawes Avenue Bridge, n-values of 0.036 to 0.045 were used to represent varying riprap sizes.

For Phase 3, from the Dawes Avenue Bridge to the confluence of the east and west branch of the Housatonic River, n-values of 0.034 and 0.04 were used representing varying riprap sizes in the riverbed and riverbank. The Manning’s n-values used are considered reasonably conservative for the final restored river channel configuration.

Geometry data used for cross-section representation for post-remediation conditions was electronically and manually imported from the completed in- and out-of-river as-built topographic drawings developed by Hill.

HEC-RAS MODEL RESULTS SUMMARY

The HEC-RAS model water surface elevation results were evaluated from Construction Stations 500+00 (Lyman Street) through Station 575+00 (confluence of east and west branches of the Housatonic River). A tabular summary of the model results is provided in Table 1. Five model output figures depict model predictions for water surface elevations for the average annual flow and the 5-, 10-, 50-, and 100-year storm events (See Figures 2A through 2E). These figures compare the water surface elevations between pre- and post-remediation conditions. Table 2 summarizes the maximum water surface elevation and maximum velocity increases and the stations at which these occurred at each storm flow analyzed and for bridge to bridge reaches of river.

Lyman Street to Elm Street

The modeling results for Lyman Street to Elm Street reach show that the implementation of the removal action does not increase water surface elevations in this reach at any location for any storm event. Results show a decrease in all water surface elevations, with the smallest decrease of 0.29 feet (ft) at the 10-year storm [4,375 cubic feet per second (cfs)] at Station 500+50, within approximately 50 feet (ft) of the Lyman Street Bridge. The maximum decrease in water surface elevation is 1.91 ft at the 5-yr storm event at Station 521+00..

The maximum increase in river flow velocity is 1.56 feet per second (ft/sec) during the 5-year storm event (3,336 cfs) at Station 520+50 (increase from 4.71 to 6.27 ft/sec), which is approximately 100 ft upstream of the Elm Street bridge. The design of the restored riverbed and riverbanks considered these velocities and the riprap sizes and other restoration features were selected to ensure long-term channel stability.

Elm Street to Dawes Avenue

The modeling results for Elm Street to Dawes Avenue reach show that the implementation of the removal action did not significantly increase water surface elevations in this reach. There are only four occurrences where there is an increase in water surface elevations. These occurrences are all located within the first 110 ft downstream of the Elm Street Bridge (Stations 522+33 to 523+10) and all occur during the average annual flow (134 cfs). The maximum increase in water surface elevation is 0.20 ft at Station 522+79. The area with the increases in water surface elevations is immediately downstream of Elm Street Bridge and occurs adjacent to and immediately downstream of the concrete façade constructed over a previously existing timber crib wall. This area of the river is in an area with high riverbanks and two high retaining walls. The maximum increase of 0.20 ft will not result in increased flooding because during these flows the river is well within the river channel. Also, since the increase in water surface elevations is limited to the average annual flow, there is no increase in the areal extent of the 100-year floodplain.

All other storm events, besides the average annual flow, show decreases in water surface elevations at all locations in this reach. The maximum decrease in water surface elevation is 3.29 ft at the 2-yr storm event at Station 524+00.

The maximum increase in river flow velocity is 7.78 ft/sec, which occurs at the 2-year storm event (2,047 cfs) at Station 524+00. At this station, the velocity increased from 6.10 ft/sec to 13.88 ft/sec. These increases are due to the use of the ACB river armoring system in this area. The ACB is much smoother than the pre-remediation conditions. This material is represented in the model from Stations 522+29 to 524+00 with lower n-values than riprap or the pre-remediation conditions and is designed to withstand these velocities.

Dawes Avenue to Pomeroy Avenue

For the Dawes Avenue to Pomeroy Avenue reach, there are no increases in water surface elevations at any location for any storm event. Results show a decrease in all water surface elevations, with the smallest decrease in water surface elevation being 0.38 ft, which occurs at Station 554+00 and at Station 557+50 during the 100-year flow event (8,721 cfs). The maximum decrease in water surface elevation is 1.96 ft at the 1.5-yr storm event at Station 544+00.

The maximum increase in river flow velocity is 2.00 ft/sec at Station 546+50, increase from 1.71 ft/sec to 3.71 ft/sec during the average annual flow (134 cfs). This station is approximately 300 ft downstream of the Dawes Avenue Bridge. The design of the restored riverbed and riverbanks considered these velocities and the riprap sizes and other restoration features were selected to ensure long-term channel stability.

Pomeroy Avenue to the Confluence

For the Pomeroy Avenue to the Confluence reach, there are no increases in water surface elevations at any location for any storm event. The results show no increase or decrease in water surface elevation at Station 573+50 at the 100-year flow event (8,721 cfs). At all other locations for all other storm events, there are decreases in water surface elevations. The maximum decrease in water surface elevation is 1.47 feet and the 2-yr storm event at Station 561+37.

The maximum increase in river flow velocity is 2.16 ft/sec, which occurs at the 100-year storm event (8,721 cfs) at Station 567+50, an increase from 1.66 ft/sec to 3.82 ft/sec. Overall, increases in velocity can be attributed to a general smoothing of the river channel, lowering of minimum channel elevations, and in some cases smoothing of out-of-river areas due to the installation of parking lots, gravel roads, and grass fields as part of the Fred Garner Park restoration. The design of the restored riverbed and riverbanks considered these velocities and the riprap sizes and other restoration features were selected to ensure long-term channel stability.

CHANGES IN FLOOD STORAGE CAPACITY

Hill calculated the changes to the flood storage capacity (FSC) within the 100-year floodplain as a result of 1.5 Mile Removal Reach remediation and restoration activities. The calculations were made by comparing the as-built topography to the pre-remediation topography using AutoCAD 2004 Land Development Desktop software and employing the “composite method”. Table 3 provides a summary of the overall FSC changes for each river reach and for the entire 1.5 Mile Reach. It includes FSC changes within the limit of work (that is, the riverbanks and river channel), and in support areas located outside of the limit of work which were impacted by

remediation activities and restored by EPA. These areas were utilized during remediation activities as support areas, access roads, water treatment plants, and staging areas. Table 4 provides a more detailed summary of FSC changes for support areas outside the limit of work.

Based on the calculations and as documented in Table 3, there was a net increase in FSC for each river reach. In addition, the total amount of FSC gain in the entire 1.5 Mile Reach was 8,424 cubic yards.

CONCLUSION

The Applicable and Relevant and Appropriate Requirements (ARARs) for the 1.5 Mile Reach Removal that are pertinent to water surface elevations, river velocities and flood storage capacity are specified in table C-3 of the February 2000 Engineering Evaluation/Cost Analysis for the 1.5 Mile Reach Removal Action. Specifically, the ARAR table requires that, “after completion of work, there will be no significant net loss of flood storage capacity and no significant increase in flood stage or river velocities”.

The modeling results for 1.5 Mile Reach as described in this report show that the implementation of the removal action did not significantly increase water surface elevations or river flow velocities in the 1.5 Mile Reach. In fact, at almost all locations for all flow events, there was a decrease in water surface elevations. In addition, remediation activities resulted in a net increase in FSC in each reach (that is, from bridge to bridge and from the Pomeroy Avenue bridge to the confluence). In addition, the remediation resulted in an overall net increase of 8,424 cubic yards in FSC for the entire 1.5 Mile Reach.

Therefore, the relevant portion of the ARARs that pertain to water surface elevations, river velocities and flood storage capacity have been met for the 1.5 Mile Reach Removal Action.

TABLES

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing	Storm	Pre-Construction		As-Built		Change (As-Built - Existing)				
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
Lyman Street	Lyman Street Bridge									
500+00 Avg Annual	134	971.69	1.82	970.48	3.03	-1.21		1.21		
500+00 0.5-yr	1422	976.63	3.72	975.78	3.91	-0.85		0.19		
500+00 1-yr	1670	977.23	3.94	976.44	4.09	-0.79		0.15		
500+00 1.5-yr	1761	977.44	4.01	976.66	4.15	-0.78		0.14		
500+00 2-yr	2047	978.07	4.23	977.32	4.35	-0.75		0.12		
500+00 5-yr	3336	980.59	4.90	979.98	4.96	-0.61		0.06		
500+00 10-yr	4375	982.28	5.31	981.92	5.26	-0.36		-0.05		
500+00 50-yr	7239	986.68	2.99	985.74	3.97	-0.94		0.98		
500+00 100-yr	8721	988.44	2.13	987.35	2.73	-1.09		0.60		
500+50 Avg Annual	134	971.71	0.89	970.57	0.64	-1.14		-0.25		
500+50 0.5-yr	1422	976.67	2.95	975.86	2.46	-0.81		-0.49		
500+50 1-yr	1670	977.27	3.17	976.52	2.65	-0.75		-0.52		
500+50 1.5-yr	1761	977.47	3.25	976.74	2.71	-0.73		-0.54		
500+50 2-yr	2047	978.10	3.47	977.40	2.90	-0.70		-0.57		
500+50 5-yr	3336	980.63	4.26	980.08	3.49	-0.55		-0.77		
500+50 10-yr	4375	982.32	4.77	982.03	3.79	-0.29		-0.98		
500+50 50-yr	7239	986.37	5.09	985.58	4.38	-0.79		-0.71		
500+50 100-yr	8721	988.14	4.94	987.11	4.37	-1.03		-0.57		
501+00 Avg Annual	134	971.70	0.81	970.54	1.36	-1.16		0.55		
501+00 0.5-yr	1422	976.66	2.76	975.74	3.41	-0.92		0.65		
501+00 1-yr	1670	977.26	2.98	976.39	3.60	-0.87		0.62		
501+00 1.5-yr	1761	977.47	3.05	976.62	3.67	-0.85		0.62		
501+00 2-yr	2047	978.10	3.27	977.27	3.87	-0.83		0.60		
501+00 5-yr	3336	980.63	4.02	979.92	4.44	-0.71		0.42		
501+00 10-yr	4375	982.33	4.49	981.87	4.68	-0.46		0.19		
501+00 50-yr	7239	986.39	4.81	985.47	5.01	-0.92		0.20		
501+00 100-yr	8721	988.15	4.71	987.01	4.95	-1.14		0.24		
501+50 Avg Annual	134	971.68	1.25	970.52	1.20	-1.16		-0.05		
501+50 0.5-yr	1422	976.58	3.35	975.72	3.37	-0.86		0.02		
501+50 1-yr	1670	977.18	3.57	976.36	3.57	-0.82		0.00		
501+50 1.5-yr	1761	977.38	3.65	976.59	3.64	-0.79		-0.01		
501+50 2-yr	2047	978.01	3.88	977.24	3.84	-0.77		-0.04		
501+50 5-yr	3336	980.52	4.65	979.88	4.42	-0.64		-0.23		
501+50 10-yr	4375	982.23	5.05	981.83	4.63	-0.40		-0.42		
501+50 50-yr	7239	986.38	4.93	985.47	4.78	-0.91		-0.15		
501+50 100-yr	8721	988.14	4.77	987.02	4.65	-1.12		-0.12		
502+00 Avg Annual	134	971.65	1.43	970.49	1.50	-1.16		0.07		
502+00 0.5-yr	1422	976.54	3.44	975.70	3.24	-0.84		-0.20		
502+00 1-yr	1670	977.14	3.64	976.35	3.38	-0.79		-0.26		
502+00 1.5-yr	1761	977.35	3.72	976.57	3.44	-0.78		-0.28		
502+00 2-yr	2047	977.97	3.92	977.22	3.59	-0.75		-0.33		
502+00 5-yr	3336	980.49	4.64	979.88	4.02	-0.61		-0.62		
502+00 10-yr	4375	982.22	4.90	981.85	4.11	-0.37		-0.79		
502+00 50-yr	7239	986.40	4.51	985.52	4.04	-0.88		-0.47		
502+00 100-yr	8721	988.16	4.35	987.07	3.86	-1.09		-0.49		
502+50 Avg Annual	134	971.64	1.10	970.50	0.94	-1.14		-0.16		
502+50 0.5-yr	1422	976.55	2.97	975.70	2.85	-0.85		-0.12		
502+50 1-yr	1670	977.15	3.17	976.35	3.02	-0.80		-0.15		
502+50 1.5-yr	1761	977.36	3.24	976.57	3.09	-0.79		-0.15		
502+50 2-yr	2047	977.99	3.44	977.22	3.27	-0.77		-0.17		
502+50 5-yr	3336	980.58	3.56	979.91	3.42	-0.67		-0.14		
502+50 10-yr	4375	982.36	3.35	981.93	2.99	-0.43		-0.36		
502+50 50-yr	7239	986.50	2.93	985.59	2.70	-0.91		-0.23		
502+50 100-yr	8721	988.24	2.89	987.12	2.68	-1.12		-0.21		
503+00 Avg Annual	134	971.63	0.99	970.48	1.19	-1.15		0.20		
503+00 0.5-yr	1422	976.56	2.44	975.66	3.02	-0.90		0.58		
503+00 1-yr	1670	977.16	2.61	976.30	3.20	-0.86		0.59		
503+00 1.5-yr	1761	977.37	2.67	976.52	3.26	-0.85		0.59		
503+00 2-yr	2047	978.01	2.84	977.17	3.44	-0.84		0.60		
503+00 5-yr	3336	980.57	3.31	979.86	3.56	-0.71		0.25		
503+00 10-yr	4375	982.32	3.40	981.92	2.85	-0.40		-0.55		
503+00 50-yr	7239	986.45	3.38	985.59	2.41	-0.86		-0.97		
503+00 100-yr	8721	988.19	3.44	987.13	2.37	-1.06		-1.07		

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
503+50	Avg Annual	134	971.57	1.69	970.44	1.56	-1.13		-0.13	
503+50	0.5-yr	1422	976.48	3.08	975.59	3.42	-0.89		0.34	
503+50	1-yr	1670	977.08	3.22	976.23	3.55	-0.85		0.33	
503+50	1.5-yr	1761	977.29	3.26	976.45	3.60	-0.84		0.34	
503+50	2-yr	2047	977.93	3.39	977.10	3.75	-0.83		0.36	
503+50	5-yr	3336	980.51	3.72	979.85	3.47	-0.66		-0.25	
503+50	10-yr	4375	982.28	3.68	981.91	2.87	-0.37		-0.81	
503+50	50-yr	7239	986.44	3.39	985.59	2.41	-0.85		-0.98	
503+50	100-yr	8721	988.19	3.37	987.13	2.35	-1.06		-1.02	
504+50	Avg Annual	134	971.50	1.33	970.31	2.25	-1.19		0.92	
504+50	0.5-yr	1422	976.43	2.83	975.47	3.69	-0.96		0.86	
504+50	1-yr	1670	977.03	2.97	976.11	3.80	-0.92		0.83	
504+50	1.5-yr	1761	977.24	3.02	976.33	3.84	-0.91		0.82	
504+50	2-yr	2047	977.88	3.16	976.98	3.97	-0.90		0.81	
504+50	5-yr	3336	980.46	3.62	979.64	4.33	-0.82		0.71	
504+50	10-yr	4375	982.21	3.82	981.68	4.28	-0.53		0.46	
504+50	50-yr	7239	986.41	3.47	985.44	3.93	-0.97		0.46	
504+50	100-yr	8721	988.17	3.37	987.02	3.70	-1.15		0.33	
505+00	Avg Annual	134	971.49	0.98	970.31	1.34	-1.18		0.36	
505+00	0.5-yr	1422	976.41	2.74	975.47	3.16	-0.94		0.42	
505+00	1-yr	1670	977.01	2.90	976.11	3.33	-0.90		0.43	
505+00	1.5-yr	1761	977.22	2.95	976.33	3.39	-0.89		0.44	
505+00	2-yr	2047	977.86	3.11	976.98	3.56	-0.88		0.45	
505+00	5-yr	3336	980.45	3.59	979.64	3.94	-0.81		0.35	
505+00	10-yr	4375	982.19	3.83	981.67	3.98	-0.52		0.15	
505+00	50-yr	7239	986.34	3.89	985.41	3.96	-0.93		0.07	
505+00	100-yr	8721	988.11	3.85	986.99	3.80	-1.12		-0.05	
505+50	Avg Annual	134	971.46	1.30	970.27	1.69	-1.19		0.39	
505+50	0.5-yr	1422	976.35	3.05	975.38	3.66	-0.97		0.61	
505+50	1-yr	1670	976.95	3.23	976.02	3.81	-0.93		0.58	
505+50	1.5-yr	1761	977.16	3.29	976.24	3.86	-0.92		0.57	
505+50	2-yr	2047	977.80	3.47	976.88	4.02	-0.92		0.55	
505+50	5-yr	3336	980.37	4.03	979.55	4.23	-0.82		0.20	
505+50	10-yr	4375	982.10	4.31	981.62	4.00	-0.48		-0.31	
505+50	50-yr	7239	986.28	4.33	985.40	3.58	-0.88		-0.75	
505+50	100-yr	8721	988.07	4.14	986.98	3.39	-1.09		-0.75	
506+00	Avg Annual	134	971.44	1.22	970.27	1.14	-1.17		-0.08	
506+00	0.5-yr	1422	976.33	2.97	975.38	3.20	-0.95		0.23	
506+00	1-yr	1670	976.93	3.13	976.01	3.39	-0.92		0.26	
506+00	1.5-yr	1761	977.14	3.18	976.23	3.46	-0.91		0.28	
506+00	2-yr	2047	977.78	3.33	976.87	3.65	-0.91		0.32	
506+00	5-yr	3336	980.37	3.75	979.51	4.10	-0.86		0.35	
506+00	10-yr	4375	982.12	3.92	981.58	3.85	-0.54		-0.07	
506+00	50-yr	7239	986.30	3.89	985.39	3.41	-0.91		-0.48	
506+00	100-yr	8721	988.10	3.61	986.98	3.19	-1.12		-0.42	
506+50	Avg Annual	134	971.43	0.99	970.23	1.57	-1.20		0.58	
506+50	0.5-yr	1422	976.33	2.64	975.29	3.68	-1.04		1.04	
506+50	1-yr	1670	976.93	2.80	975.93	3.82	-1.00		1.02	
506+50	1.5-yr	1761	977.14	2.86	976.14	3.87	-1.00		1.01	
506+50	2-yr	2047	977.79	3.00	976.78	4.01	-1.01		1.01	
506+50	5-yr	3336	980.38	3.43	979.46	4.04	-0.92		0.61	
506+50	10-yr	4375	982.13	3.61	981.54	3.46	-0.59		-0.15	
506+50	50-yr	7239	986.33	3.42	985.39	2.75	-0.94		-0.67	
506+50	100-yr	8721	988.11	3.18	986.98	2.50	-1.13		-0.68	
507+00	Avg Annual	134	971.41	1.17	970.24	0.97	-1.17		-0.20	
507+00	0.5-yr	1422	976.28	2.92	975.32	2.82	-0.96		-0.10	
507+00	1-yr	1670	976.88	3.10	975.96	3.00	-0.92		-0.10	
507+00	1.5-yr	1761	977.09	3.17	976.17	3.06	-0.92		-0.11	
507+00	2-yr	2047	977.73	3.35	976.81	3.23	-0.92		-0.12	
507+00	5-yr	3336	980.30	3.92	979.46	3.49	-0.84		-0.43	
507+00	10-yr	4375	982.03	4.19	981.52	3.21	-0.51		-0.98	
507+00	50-yr	7239	986.27	3.88	985.35	2.91	-0.92		-0.97	
507+00	100-yr	8721	988.07	3.64	986.95	2.72	-1.12		-0.92	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
507+50	Avg Annual	134	971.40	1.00	970.23	0.93	-1.17		-0.07	
507+50	0.5-yr	1422	976.27	2.76	975.32	2.49	-0.95		-0.27	
507+50	1-yr	1670	976.87	2.93	975.96	2.66	-0.91		-0.27	
507+50	1.5-yr	1761	977.08	2.98	976.18	2.71	-0.90		-0.27	
507+50	2-yr	2047	977.72	3.15	976.82	2.88	-0.90		-0.27	
507+50	5-yr	3336	980.30	3.62	979.45	3.32	-0.85		-0.30	
507+50	10-yr	4375	982.04	3.93	981.48	3.26	-0.56		-0.67	
507+50	50-yr	7239	986.26	3.78	985.36	2.41	-0.90		-1.37	
507+50	100-yr	8721	988.06	3.56	986.97	2.06	-1.09		-1.50	
508+00	Avg Annual	134	971.40	0.87	970.22	0.91	-1.18		0.04	
508+00	0.5-yr	1422	976.26	2.62	975.26	3.01	-1.00		0.39	
508+00	1-yr	1670	976.86	2.80	975.89	3.20	-0.97		0.40	
508+00	1.5-yr	1761	977.07	2.87	976.10	3.27	-0.97		0.40	
508+00	2-yr	2047	977.71	3.04	976.73	3.46	-0.98		0.42	
508+00	5-yr	3336	980.28	3.64	979.33	3.99	-0.95		0.35	
508+00	10-yr	4375	982.02	3.92	981.36	3.84	-0.66		-0.08	
508+00	50-yr	7239	986.27	3.61	985.25	3.31	-1.02		-0.30	
508+00	100-yr	8721	988.07	3.33	986.90	2.84	-1.17		-0.49	
508+50	Avg Annual	134	971.39	0.93	970.16	1.89	-1.23		0.96	
508+50	0.5-yr	1422	976.24	2.63	975.17	3.56	-1.07		0.93	
508+50	1-yr	1670	976.84	2.80	975.80	3.69	-1.04		0.89	
508+50	1.5-yr	1761	977.05	2.86	976.02	3.73	-1.03		0.87	
508+50	2-yr	2047	977.69	3.03	976.65	3.86	-1.04		0.83	
508+50	5-yr	3336	980.26	3.60	979.27	4.15	-0.99		0.55	
508+50	10-yr	4375	982.00	3.87	981.28	3.84	-0.72		-0.03	
508+50	50-yr	7239	986.26	3.56	985.23	3.02	-1.03		-0.54	
508+50	100-yr	8721	988.07	3.20	986.90	2.50	-1.17		-0.70	
509+00	Avg Annual	134	971.38	0.73	970.16	1.13	-1.22		0.40	
509+00	0.5-yr	1422	976.23	2.49	975.19	2.90	-1.04		0.41	
509+00	1-yr	1670	976.83	2.66	975.81	3.06	-1.02		0.40	
509+00	1.5-yr	1761	977.04	2.72	976.03	3.12	-1.01		0.40	
509+00	2-yr	2047	977.68	2.90	976.66	3.28	-1.02		0.38	
509+00	5-yr	3336	980.26	3.46	979.26	3.60	-1.00		0.14	
509+00	10-yr	4375	982.00	3.74	981.23	3.32	-0.77		-0.42	
509+00	50-yr	7239	986.26	3.51	985.19	2.98	-1.07		-0.53	
509+00	100-yr	8721	988.06	3.28	986.86	2.70	-1.20		-0.58	
509+50	Avg Annual	134	971.37	1.04	970.13	1.33	-1.24		0.29	
509+50	0.5-yr	1422	976.18	2.87	975.15	3.02	-1.03		0.15	
509+50	1-yr	1670	976.78	3.05	975.78	3.16	-1.00		0.11	
509+50	1.5-yr	1761	976.99	3.11	976.00	3.21	-0.99		0.10	
509+50	2-yr	2047	977.62	3.29	976.63	3.36	-0.99		0.07	
509+50	5-yr	3336	980.19	3.85	979.20	3.71	-0.99		-0.14	
509+50	10-yr	4375	981.96	3.99	981.17	3.18	-0.79		-0.81	
509+50	50-yr	7239	986.22	3.82	985.17	2.85	-1.05		-0.97	
509+50	100-yr	8721	988.04	3.45	986.85	2.64	-1.19		-0.81	
510+00	Avg Annual	134	971.35	1.10	970.12	1.23	-1.23		0.13	
510+00	0.5-yr	1422	976.13	3.07	975.10	3.22	-1.03		0.15	
510+00	1-yr	1670	976.73	3.25	975.73	3.41	-1.00		0.16	
510+00	1.5-yr	1761	976.94	3.32	975.94	3.47	-1.00		0.15	
510+00	2-yr	2047	977.57	3.49	976.57	3.67	-1.00		0.18	
510+00	5-yr	3336	980.15	4.03	979.07	4.26	-1.08		0.23	
510+00	10-yr	4375	981.93	4.15	981.01	3.98	-0.92		-0.17	
510+00	50-yr	7239	986.20	3.94	985.10	3.40	-1.10		-0.54	
510+00	100-yr	8721	988.01	3.70	986.80	3.08	-1.21		-0.62	
510+50	Avg Annual	134	971.32	1.32	970.10	1.29	-1.22		-0.03	
510+50	0.5-yr	1422	976.05	3.50	975.05	3.40	-1.00		-0.10	
510+50	1-yr	1670	976.64	3.70	975.68	3.56	-0.96		-0.14	
510+50	1.5-yr	1761	976.85	3.77	975.89	3.62	-0.96		-0.15	
510+50	2-yr	2047	977.48	3.96	976.52	3.77	-0.96		-0.19	
510+50	5-yr	3336	980.03	4.63	979.02	4.18	-1.01		-0.45	
510+50	10-yr	4375	981.82	4.73	980.91	3.72	-0.91		-1.01	
510+50	50-yr	7239	986.10	4.64	985.07	3.14	-1.03		-1.50	
510+50	100-yr	8721	987.92	4.46	986.78	2.87	-1.14		-1.59	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
511+00	Avg Annual	134	971.31	1.01	970.09	1.16	-1.22		0.15	
511+00	0.5-yr	1422	976.03	3.04	975.05	3.08	-0.98		0.04	
511+00	1-yr	1670	976.63	3.23	975.66	3.25	-0.97		0.02	
511+00	1.5-yr	1761	976.84	3.29	975.87	3.30	-0.97		0.01	
511+00	2-yr	2047	977.47	3.46	976.50	3.46	-0.97		0.00	
511+00	5-yr	3336	980.07	3.82	979.00	3.35	-1.07		-0.47	
511+00	10-yr	4375	981.87	3.89	980.88	3.03	-0.99		-0.86	
511+00	50-yr	7239	986.15	3.76	985.07	2.67	-1.08		-1.09	
511+00	100-yr	8721	987.96	3.63	986.78	2.55	-1.18		-1.08	
511+50	Avg Annual	134	971.30	1.03	970.04	1.73	-1.26		0.70	
511+50	0.5-yr	1422	976.00	2.95	974.93	3.78	-1.07		0.83	
511+50	1-yr	1670	976.59	3.13	975.53	3.95	-1.06		0.82	
511+50	1.5-yr	1761	976.80	3.20	975.74	4.01	-1.06		0.81	
511+50	2-yr	2047	977.44	3.39	976.36	4.18	-1.08		0.79	
511+50	5-yr	3336	980.00	4.02	978.74	4.68	-1.26		0.66	
511+50	10-yr	4375	981.77	4.25	980.62	4.53	-1.15		0.28	
511+50	50-yr	7239	986.05	4.27	984.92	3.94	-1.13		-0.33	
511+50	100-yr	8721	987.89	4.12	986.67	3.76	-1.22		-0.36	
512+00	Avg Annual	134	971.28	1.05	970.03	1.33	-1.25		0.28	
512+00	0.5-yr	1422	975.95	3.02	974.91	3.52	-1.04		0.50	
512+00	1-yr	1670	976.55	3.22	975.51	3.73	-1.04		0.51	
512+00	1.5-yr	1761	976.76	3.29	975.72	3.80	-1.04		0.51	
512+00	2-yr	2047	977.39	3.49	976.33	4.01	-1.06		0.52	
512+00	5-yr	3336	979.94	4.18	978.68	4.70	-1.26		0.52	
512+00	10-yr	4375	981.69	4.53	980.50	4.94	-1.19		0.41	
512+00	50-yr	7239	986.04	4.32	984.83	4.56	-1.21		0.24	
512+00	100-yr	8721	987.88	4.10	986.60	4.30	-1.28		0.20	
512+50	Avg Annual	134	971.27	0.89	970.01	1.53	-1.26		0.64	
512+50	0.5-yr	1422	975.93	2.99	974.81	4.03	-1.12		1.04	
512+50	1-yr	1670	976.52	3.19	975.40	4.22	-1.12		1.03	
512+50	1.5-yr	1761	976.73	3.26	975.60	4.28	-1.13		1.02	
512+50	2-yr	2047	977.36	3.46	976.22	4.42	-1.14		0.96	
512+50	5-yr	3336	979.92	4.11	978.60	4.86	-1.32		0.75	
512+50	10-yr	4375	981.67	4.49	980.43	4.91	-1.24		0.42	
512+50	50-yr	7239	985.95	4.73	984.82	4.05	-1.13		-0.68	
512+50	100-yr	8721	987.77	4.69	986.61	3.61	-1.16		-1.08	
513+00	Avg Annual	134	971.27	0.76	969.99	1.31	-1.28		0.55	
513+00	0.5-yr	1422	975.90	2.94	974.80	3.67	-1.10		0.73	
513+00	1-yr	1670	976.49	3.16	975.38	3.88	-1.11		0.72	
513+00	1.5-yr	1761	976.70	3.23	975.58	3.95	-1.12		0.72	
513+00	2-yr	2047	977.34	3.44	976.19	4.12	-1.15		0.68	
513+00	5-yr	3336	979.90	4.10	978.56	4.57	-1.34		0.47	
513+00	10-yr	4375	981.64	4.55	980.40	4.57	-1.24		0.02	
513+00	50-yr	7239	985.92	4.80	984.74	4.39	-1.18		-0.41	
513+00	100-yr	8721	987.77	4.64	986.52	4.20	-1.25		-0.44	
513+50	Avg Annual	134	971.25	0.88	970.00	0.92	-1.25		0.04	
513+50	0.5-yr	1422	975.87	2.86	974.80	3.17	-1.07		0.31	
513+50	1-yr	1670	976.47	3.03	975.38	3.37	-1.09		0.34	
513+50	1.5-yr	1761	976.68	3.09	975.59	3.44	-1.09		0.35	
513+50	2-yr	2047	977.31	3.26	976.19	3.63	-1.12		0.37	
513+50	5-yr	3336	979.88	3.85	978.55	4.22	-1.33		0.37	
513+50	10-yr	4375	981.62	4.26	980.37	4.43	-1.25		0.17	
513+50	50-yr	7239	985.95	4.19	984.70	4.52	-1.25		0.33	
513+50	100-yr	8721	987.79	4.06	986.49	4.31	-1.30		0.25	
514+00	Avg Annual	134	971.24	0.92	969.99	0.78	-1.25		-0.14	
514+00	0.5-yr	1422	975.80	3.20	974.78	3.01	-1.02		-0.19	
514+00	1-yr	1670	976.39	3.41	975.36	3.22	-1.03		-0.19	
514+00	1.5-yr	1761	976.60	3.48	975.56	3.30	-1.04		-0.18	
514+00	2-yr	2047	977.23	3.69	976.17	3.51	-1.06		-0.18	
514+00	5-yr	3336	979.79	4.32	978.51	4.18	-1.28		-0.14	
514+00	10-yr	4375	981.59	4.48	980.33	4.43	-1.26		-0.05	
514+00	50-yr	7239	986.03	3.15	984.81	2.99	-1.22		-0.16	
514+00	100-yr	8721	987.87	2.53	986.61	2.27	-1.26		-0.26	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
514+50	Avg Annual	134	971.24	0.89	969.98	0.94	-1.26		0.05	
514+50	0.5-yr	1422	975.77	3.12	974.72	3.25	-1.05		0.13	
514+50	1-yr	1670	976.36	3.33	975.29	3.48	-1.07		0.15	
514+50	1.5-yr	1761	976.57	3.41	975.49	3.56	-1.08		0.15	
514+50	2-yr	2047	977.20	3.61	976.09	3.80	-1.11		0.19	
514+50	5-yr	3336	979.76	4.27	978.40	4.59	-1.36		0.32	
514+50	10-yr	4375	981.55	4.46	980.21	4.92	-1.34		0.46	
514+50	50-yr	7239	986.01	3.22	984.77	3.05	-1.24		-0.17	
514+50	100-yr	8721	987.86	2.58	986.58	2.34	-1.28		-0.24	
515+00	Avg Annual	134	971.22	1.12	969.98	0.79	-1.24		-0.33	
515+00	0.5-yr	1422	975.71	3.36	974.68	3.25	-1.03		-0.11	
515+00	1-yr	1670	976.30	3.57	975.25	3.51	-1.05		-0.06	
515+00	1.5-yr	1761	976.50	3.64	975.45	3.60	-1.05		-0.04	
515+00	2-yr	2047	977.13	3.84	976.04	3.86	-1.09		0.02	
515+00	5-yr	3336	979.68	4.51	978.33	4.75	-1.35		0.24	
515+00	10-yr	4375	981.46	4.79	980.12	5.13	-1.34		0.34	
515+00	50-yr	7239	985.90	4.09	984.65	3.73	-1.25		-0.36	
515+00	100-yr	8721	987.81	3.30	986.51	2.99	-1.30		-0.31	
515+50	Avg Annual	134	971.21	0.82	969.98	0.70	-1.23		-0.12	
515+50	0.5-yr	1422	975.69	3.05	974.69	2.80	-1.00		-0.25	
515+50	1-yr	1670	976.28	3.28	975.26	3.01	-1.02		-0.27	
515+50	1.5-yr	1761	976.49	3.35	975.46	3.09	-1.03		-0.26	
515+50	2-yr	2047	977.12	3.58	976.05	3.30	-1.07		-0.28	
515+50	5-yr	3336	979.67	4.33	978.35	4.04	-1.32		-0.29	
515+50	10-yr	4375	981.42	4.78	980.16	4.37	-1.26		-0.41	
515+50	50-yr	7239	985.74	4.96	984.52	4.38	-1.22		-0.58	
515+50	100-yr	8721	987.65	4.54	986.39	3.98	-1.26		-0.56	
516+00	Avg Annual	134	971.20	0.95	969.98	0.65	-1.22		-0.30	
516+00	0.5-yr	1422	975.64	3.19	974.65	2.92	-0.99		-0.27	
516+00	1-yr	1670	976.24	3.39	975.21	3.16	-1.03		-0.23	
516+00	1.5-yr	1761	976.44	3.46	975.41	3.25	-1.03		-0.21	
516+00	2-yr	2047	977.07	3.66	975.99	3.49	-1.08		-0.17	
516+00	5-yr	3336	979.63	4.34	978.28	4.31	-1.35		-0.03	
516+00	10-yr	4375	981.39	4.76	980.07	4.69	-1.32		-0.07	
516+00	50-yr	7239	985.71	4.94	984.42	4.73	-1.29		-0.21	
516+00	100-yr	8721	987.65	4.37	986.33	4.23	-1.32		-0.14	
516+50	Avg Annual	134	971.20	0.88	969.96	0.97	-1.24		0.09	
516+50	0.5-yr	1422	975.57	3.50	974.49	3.95	-1.08		0.45	
516+50	1-yr	1670	976.15	3.75	975.04	4.25	-1.11		0.50	
516+50	1.5-yr	1761	976.36	3.83	975.23	4.36	-1.13		0.53	
516+50	2-yr	2047	976.98	4.08	975.79	4.65	-1.19		0.57	
516+50	5-yr	3336	979.50	4.91	978.01	5.59	-1.49		0.68	
516+50	10-yr	4375	981.24	5.43	979.79	5.93	-1.45		0.50	
516+50	50-yr	7239	985.40	6.31	984.11	6.21	-1.29		-0.10	
516+50	100-yr	8721	987.39	5.82	986.08	5.72	-1.31		-0.10	
517+00	Avg Annual	134	971.19	0.85	969.96	0.88	-1.23		0.03	
517+00	0.5-yr	1422	975.51	3.66	974.46	3.79	-1.05		0.13	
517+00	1-yr	1670	976.08	3.95	975.00	4.10	-1.08		0.15	
517+00	1.5-yr	1761	976.28	4.04	975.18	4.21	-1.10		0.17	
517+00	2-yr	2047	976.90	4.33	975.74	4.52	-1.16		0.19	
517+00	5-yr	3336	979.40	5.27	977.94	5.54	-1.46		0.27	
517+00	10-yr	4375	981.12	5.84	979.72	5.93	-1.40		0.09	
517+00	50-yr	7239	985.40	6.31	984.03	6.22	-1.37		-0.09	
517+00	100-yr	8721	987.42	5.59	985.98	5.86	-1.44		0.27	
517+50	Avg Annual	134	971.18	0.86	969.96	0.86	-1.22		0.00	
517+50	0.5-yr	1422	975.48	3.40	974.42	3.73	-1.06		0.33	
517+50	1-yr	1670	976.06	3.65	974.95	4.05	-1.11		0.40	
517+50	1.5-yr	1761	976.27	3.74	975.14	4.15	-1.13		0.41	
517+50	2-yr	2047	976.88	3.99	975.69	4.47	-1.19		0.48	
517+50	5-yr	3336	979.40	4.82	977.87	5.52	-1.53		0.70	
517+50	10-yr	4375	981.14	5.33	979.64	5.93	-1.50		0.60	
517+50	50-yr	7239	985.30	6.32	983.92	6.41	-1.38		0.09	
517+50	100-yr	8721	987.21	6.21	985.84	6.24	-1.37		0.03	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
518+00	Avg Annual	134	971.18	0.85	969.95	0.85	-1.23		0.00	
518+00	0.5-yr	1422	975.46	3.27	974.39	3.53	-1.07		0.26	
518+00	1-yr	1670	976.04	3.50	974.92	3.81	-1.12		0.31	
518+00	1.5-yr	1761	976.24	3.58	975.11	3.90	-1.13		0.32	
518+00	2-yr	2047	976.86	3.82	975.66	4.18	-1.20		0.36	
518+00	5-yr	3336	979.38	4.61	977.85	5.09	-1.53		0.48	
518+00	10-yr	4375	981.12	5.10	979.64	5.41	-1.48		0.31	
518+00	50-yr	7239	985.30	6.03	983.94	5.80	-1.36		-0.23	
518+00	100-yr	8721	987.18	6.11	985.84	5.82	-1.34		-0.29	
518+50	Avg Annual	134	971.17	0.78	969.95	0.62	-1.22		-0.16	
518+50	0.5-yr	1422	975.45	2.92	974.41	2.82	-1.04		-0.10	
518+50	1-yr	1670	976.03	3.11	974.94	3.07	-1.09		-0.04	
518+50	1.5-yr	1761	976.24	3.18	975.13	3.15	-1.11		-0.03	
518+50	2-yr	2047	976.86	3.37	975.69	3.40	-1.17		0.03	
518+50	5-yr	3336	979.41	4.00	977.88	4.22	-1.53		0.22	
518+50	10-yr	4375	981.16	4.39	979.68	4.54	-1.48		0.15	
518+50	50-yr	7239	985.38	5.10	984.00	4.90	-1.38		-0.20	
518+50	100-yr	8721	987.26	5.18	985.89	4.96	-1.37		-0.22	
519+00	Avg Annual	134	971.15	1.13	969.94	0.88	-1.21		-0.25	
519+00	0.5-yr	1422	975.31	3.74	974.34	3.18	-0.97		-0.56	
519+00	1-yr	1670	975.89	3.95	974.88	3.42	-1.01		-0.53	
519+00	1.5-yr	1761	976.09	4.01	975.06	3.50	-1.03		-0.51	
519+00	2-yr	2047	976.71	4.21	975.61	3.73	-1.10		-0.48	
519+00	5-yr	3336	979.24	4.86	977.80	4.51	-1.44		-0.35	
519+00	10-yr	4375	980.99	5.26	979.59	4.81	-1.40		-0.45	
519+00	50-yr	7239	985.17	6.06	983.89	5.27	-1.28		-0.79	
519+00	100-yr	8721	987.01	6.35	985.77	5.42	-1.24		-0.93	
519+50	Avg Annual	134	971.11	1.58	969.92	1.13	-1.19		-0.45	
519+50	0.5-yr	1422	975.15	4.39	974.24	3.69	-0.91		-0.70	
519+50	1-yr	1670	975.72	4.60	974.76	3.94	-0.96		-0.66	
519+50	1.5-yr	1761	975.92	4.67	974.94	4.03	-0.98		-0.64	
519+50	2-yr	2047	976.54	4.87	975.48	4.28	-1.06		-0.59	
519+50	5-yr	3336	979.08	5.49	977.64	5.08	-1.44		-0.41	
519+50	10-yr	4375	980.84	5.86	979.44	5.34	-1.40		-0.52	
519+50	50-yr	7239	985.07	6.50	983.75	5.73	-1.32		-0.77	
519+50	100-yr	8721	986.89	6.82	985.63	5.88	-1.26		-0.94	
520+00	Avg Annual	134	971.09	1.28	969.89	1.31	-1.20		0.03	
520+00	0.5-yr	1422	975.08	4.19	974.08	4.30	-1.00		0.11	
520+00	1-yr	1670	975.66	4.43	974.59	4.62	-1.07		0.19	
520+00	1.5-yr	1761	975.86	4.50	974.76	4.73	-1.10		0.23	
520+00	2-yr	2047	976.48	4.74	975.28	5.04	-1.20		0.30	
520+00	5-yr	3336	979.01	5.50	977.37	6.01	-1.64		0.51	
520+00	10-yr	4375	980.74	6.00	979.17	6.25	-1.57		0.25	
520+00	50-yr	7239	984.89	6.95	983.50	6.53	-1.39		-0.42	
520+00	100-yr	8721	986.69	7.37	985.38	6.67	-1.31		-0.70	
520+50	Avg Annual	134	971.08	0.93	969.85	1.46	-1.23		0.53	
520+50	0.5-yr	1422	975.08	3.50	973.95	4.50	-1.13		1.00	
520+50	1-yr	1670	975.66	3.71	974.45	4.81	-1.21		1.10	
520+50	1.5-yr	1761	975.87	3.78	974.62	4.92	-1.25		1.14	
520+50	2-yr	2047	976.49	3.99	975.13	5.25	-1.36		1.26	
520+50	5-yr	3336	979.05	4.71	977.18	6.27	-1.87		1.56	
520+50	10-yr	4375	980.79	5.17	978.98	6.53	-1.81		1.36	
520+50	50-yr	7239	984.96	6.07	983.32	6.88	-1.64		0.81	
520+50	100-yr	8721	986.77	6.46	985.19	7.04	-1.58		0.58	
521+00	Avg Annual	134	971.06	1.18	969.84	1.21	-1.22		0.03	
521+00	0.5-yr	1422	974.96	4.00	973.85	4.50	-1.11		0.50	
521+00	1-yr	1670	975.53	4.21	974.33	4.84	-1.20		0.63	
521+00	1.5-yr	1761	975.74	4.28	974.50	4.96	-1.24		0.68	
521+00	2-yr	2047	976.36	4.49	975.00	5.31	-1.36		0.82	
521+00	5-yr	3336	978.91	5.19	977.00	6.42	-1.91		1.23	
521+00	10-yr	4375	980.65	5.65	978.81	6.68	-1.84		1.03	
521+00	50-yr	7239	984.81	6.56	983.16	7.11	-1.65		0.55	
521+00	100-yr	8721	986.61	6.97	985.00	7.40	-1.61		0.43	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing	Storm	Pre-Construction		As-Built		Change (As-Built - Existing)				
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
521+50 Avg Annual	134	970.99	1.80	969.82	1.19	-1.17			-0.61	
521+50 0.5-yr	1422	974.68	5.11	973.72	4.66	-0.96			-0.45	
521+50 1-yr	1670	975.24	5.38	974.19	5.03	-1.05			-0.35	
521+50 1.5-yr	1761	975.44	5.47	974.35	5.16	-1.09			-0.31	
521+50 2-yr	2047	976.05	5.73	974.83	5.55	-1.22			-0.18	
521+50 5-yr	3336	978.53	6.66	976.74	6.90	-1.79			0.24	
521+50 10-yr	4375	980.19	7.33	978.48	7.45	-1.71			0.12	
521+50 50-yr	7239	984.14	8.77	982.62	8.66	-1.52			-0.11	
521+50 100-yr	8721	985.81	9.47	984.35	9.28	-1.46			-0.19	
521+53 Avg Annual	134	970.86	3.22	969.81	1.33	-1.05			-1.89	
521+53 0.5-yr	1422	974.34	6.78	973.68	4.86	-0.66			-1.92	
521+53 1-yr	1670	974.92	6.90	974.15	5.24	-0.77			-1.66	
521+53 1.5-yr	1761	975.12	6.94	974.31	5.36	-0.81			-1.58	
521+53 2-yr	2047	975.75	7.07	974.79	5.74	-0.96			-1.33	
521+53 5-yr	3336	978.31	7.55	976.70	7.07	-1.61			-0.48	
521+53 10-yr	4375	980.00	8.06	978.44	7.58	-1.56			-0.48	
521+53 50-yr	7239	983.99	9.25	982.60	8.73	-1.39			-0.52	
521+53 100-yr	8721	985.67	9.87	984.33	9.34	-1.34			-0.53	
Elm St		Elm Street Bridge								
522+18 Avg Annual	134	970.14	4.68	969.78	1.50	-0.36			-3.18	
522+18 0.5-yr	1422	974.06	6.70	973.54	5.17	-0.52			-1.53	
522+18 1-yr	1670	974.67	6.83	973.99	5.57	-0.68			-1.26	
522+18 1.5-yr	1761	974.88	6.87	974.15	5.70	-0.73			-1.17	
522+18 2-yr	2047	975.53	7.01	974.61	6.11	-0.92			-0.90	
522+18 5-yr	3336	978.06	7.57	976.46	7.48	-1.60			-0.09	
522+18 10-yr	4375	979.68	8.09	978.20	7.87	-1.48			-0.22	
522+18 50-yr	7239	983.35	9.34	982.22	8.90	-1.13			-0.44	
522+18 100-yr	8721	984.75	10.09	983.80	9.54	-0.95			-0.55	
522+33 Avg Annual	134	969.69	2.88	969.79	1.26	0.10			-1.62	
522+33 0.5-yr	1422	974.05	6.17	973.56	4.89	-0.49			-1.28	
522+33 1-yr	1670	974.66	6.36	974.01	5.29	-0.65			-1.07	
522+33 1.5-yr	1761	974.87	6.43	974.16	5.44	-0.71			-0.99	
522+33 2-yr	2047	975.52	6.62	974.62	5.86	-0.90			-0.76	
522+33 5-yr	3336	978.05	7.32	976.45	7.37	-1.60			0.05	
522+33 10-yr	4375	979.67	7.88	978.17	7.90	-1.50			0.02	
522+33 50-yr	7239	983.36	9.07	982.17	9.01	-1.19			-0.06	
522+33 100-yr	8721	984.79	9.71	983.77	9.59	-1.02			-0.12	
522+50 Avg Annual	134	969.63	2.79	969.77	1.60	0.14			-1.19	
522+50 0.5-yr	1422	973.96	6.20	973.49	5.17	-0.47			-1.03	
522+50 1-yr	1670	974.56	6.43	973.94	5.57	-0.62			-0.86	
522+50 1.5-yr	1761	974.77	6.51	974.10	5.70	-0.67			-0.81	
522+50 2-yr	2047	975.41	6.74	974.55	6.12	-0.86			-0.62	
522+50 5-yr	3336	977.92	7.53	976.38	7.58	-1.54			0.05	
522+50 10-yr	4375	979.55	8.04	978.11	8.04	-1.44			0.00	
522+50 50-yr	7239	983.25	9.17	982.14	9.03	-1.11			-0.14	
522+50 100-yr	8721	984.68	9.80	983.74	9.56	-0.94			-0.24	
522+79 Avg Annual	134	969.54	2.54	969.74	1.87	0.20	MAX		-0.67	
522+79 0.5-yr	1422	973.71	6.50	973.15	6.68	-0.56			0.18	
522+79 1-yr	1670	974.30	6.82	973.53	7.26	-0.77			0.44	
522+79 1.5-yr	1761	974.50	6.92	973.66	7.46	-0.84			0.54	
522+79 2-yr	2047	975.12	7.22	974.03	8.09	-1.09			0.87	
522+79 5-yr	3336	977.58	8.18	975.49	10.31	-2.09			2.13	
522+79 10-yr	4375	979.16	8.84	977.28	10.50	-1.88			1.66	
522+79 50-yr	7239	982.70	10.42	981.35	11.14	-1.35			0.72	
522+79 100-yr	8721	984.00	11.32	982.91	11.68	-1.09			0.36	
523+10 Avg Annual	134	969.47	2.23	969.66	2.62	0.19			0.39	
523+10 0.5-yr	1422	973.41	6.85	973.01	7.01	-0.40			0.16	
523+10 1-yr	1670	973.97	7.24	973.41	7.46	-0.56			0.22	
523+10 1.5-yr	1761	974.16	7.36	973.55	7.62	-0.61			0.26	
523+10 2-yr	2047	974.76	7.70	973.96	8.09	-0.80			0.39	
523+10 5-yr	3336	977.19	8.70	975.54	9.65	-1.65			0.95	
523+10 10-yr	4375	978.76	9.35	977.44	9.38	-1.32			0.03	
523+10 50-yr	7239	982.40	10.61	981.59	9.71	-0.81			-0.90	
523+10 100-yr	8721	983.72	11.43	983.19	10.15	-0.53			-1.28	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
523+50	Avg Annual	134	969.38	2.27	969.15	5.49	-0.23		3.22	
523+50	0.5-yr	1422	973.25	6.16	972.08	9.76	-1.17		3.60	
523+50	1-yr	1670	973.83	6.42	972.42	10.24	-1.41		3.82	
523+50	1.5-yr	1761	974.04	6.50	972.55	10.38	-1.49		3.88	
523+50	2-yr	2047	974.66	6.74	972.94	10.79	-1.72		4.05	
523+50	5-yr	3336	977.15	7.56	974.98	10.86	-2.17		3.30	
523+50	10-yr	4375	978.74	8.18	977.24	9.71	-1.50		1.53	
523+50	50-yr	7239	982.46	9.48	981.55	9.55	-0.91		0.07	
523+50	100-yr	8721	983.81	10.26	983.16	9.90	-0.65		-0.36	
524+00	Avg Annual	134	968.75	4.89	968.17	6.62	-0.58		1.73	
524+00	0.5-yr	1422	973.00	5.71	970.41	12.86	-2.59		7.15	
524+00	1-yr	1670	973.62	5.86	970.74	13.30	-2.88		7.44	
524+00	1.5-yr	1761	973.84	5.91	970.85	13.45	-2.99		7.54	
524+00	2-yr	2047	974.49	6.10	971.20	13.88	-3.29		7.78 MAX	
524+00	5-yr	3336	977.04	6.84	975.26	8.77	-1.78		1.93	
524+00	10-yr	4375	978.65	7.47	977.39	8.33	-1.26		0.86	
524+00	50-yr	7239	982.40	8.82	981.64	8.59	-0.76		-0.23	
524+00	100-yr	8721	983.76	9.60	983.25	8.91	-0.51		-0.69	
524+50	Avg Annual	134	968.63	1.93	967.40	5.37	-1.23		3.44	
524+50	0.5-yr	1422	972.86	5.18	971.57	7.15	-1.29		1.97	
524+50	1-yr	1670	973.48	5.44	972.06	7.46	-1.42		2.02	
524+50	1.5-yr	1761	973.70	5.53	972.24	7.56	-1.46		2.03	
524+50	2-yr	2047	974.36	5.80	972.76	7.83	-1.60		2.03	
524+50	5-yr	3336	976.91	6.80	975.20	8.17	-1.71		1.37	
524+50	10-yr	4375	978.49	7.57	977.32	7.87	-1.17		0.30	
524+50	50-yr	7239	982.19	9.17	981.58	8.00	-0.61		-1.17	
524+50	100-yr	8721	983.49	10.08	983.20	8.26	-0.29		-1.82	
525+00	Avg Annual	134	968.62	1.18	967.51	1.83	-1.11		0.65	
525+00	0.5-yr	1422	972.84	4.18	971.62	5.59	-1.22		1.41	
525+00	1-yr	1670	973.47	4.41	972.11	5.97	-1.36		1.56	
525+00	1.5-yr	1761	973.70	4.49	972.28	6.09	-1.42		1.60	
525+00	2-yr	2047	974.36	4.73	972.80	6.44	-1.56		1.71	
525+00	5-yr	3336	976.95	5.63	975.18	7.24	-1.77		1.61	
525+00	10-yr	4375	978.56	6.32	977.23	7.27	-1.33		0.95	
525+00	50-yr	7239	982.29	7.79	981.45	7.61	-0.84		-0.18	
525+00	100-yr	8721	983.62	8.59	983.06	7.92	-0.56		-0.67	
525+50	Avg Annual	134	968.52	2.23	967.39	2.60	-1.13		0.37	
525+50	0.5-yr	1422	972.46	5.54	971.25	6.65	-1.21		1.11	
525+50	1-yr	1670	973.12	5.63	971.72	7.01	-1.40		1.38	
525+50	1.5-yr	1761	973.34	5.67	971.89	7.12	-1.45		1.45	
525+50	2-yr	2047	974.03	5.79	972.40	7.43	-1.63		1.64	
525+50	5-yr	3336	976.69	6.27	974.83	7.92	-1.86		1.65	
525+50	10-yr	4375	978.33	6.74	976.92	7.78	-1.41		1.04	
525+50	50-yr	7239	982.17	7.65	981.14	8.09	-1.03		0.44	
525+50	100-yr	8721	983.52	8.26	982.72	8.41	-0.80		0.15	
526+00	Avg Annual	134	968.40	2.07	967.20	3.07	-1.20		1.00	
526+00	0.5-yr	1422	972.31	5.09	971.00	6.79	-1.31		1.70	
526+00	1-yr	1670	972.96	5.22	971.48	7.13	-1.48		1.91	
526+00	1.5-yr	1761	973.19	5.27	971.65	7.24	-1.54		1.97	
526+00	2-yr	2047	973.88	5.42	972.17	7.53	-1.71		2.11	
526+00	5-yr	3336	976.55	5.97	974.63	7.93	-1.92		1.96	
526+00	10-yr	4375	978.19	6.46	976.73	7.69	-1.46		1.23	
526+00	50-yr	7239	982.02	7.48	980.96	7.98	-1.06		0.50	
526+00	100-yr	8721	983.36	8.12	982.53	8.35	-0.83		0.23	
526+50	Avg Annual	134	967.92	3.94	967.14	2.19	-0.78		-1.75	
526+50	0.5-yr	1422	971.96	5.77	970.92	6.04	-1.04		0.27	
526+50	1-yr	1670	972.66	5.80	971.40	6.39	-1.26		0.59	
526+50	1.5-yr	1761	972.90	5.81	971.57	6.51	-1.33		0.70	
526+50	2-yr	2047	973.60	5.90	972.09	6.83	-1.51		0.93	
526+50	5-yr	3336	976.32	6.29	974.51	7.41	-1.81		1.12	
526+50	10-yr	4375	977.97	6.72	976.61	7.27	-1.36		0.55	
526+50	50-yr	7239	981.83	7.68	980.85	7.57	-0.98		-0.11	
526+50	100-yr	8721	983.15	8.35	982.42	7.95	-0.73		-0.40	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
527+00	Avg Annual	134	966.99	3.77	966.88	3.47	-0.11		-0.30	
527+00	0.5-yr	1422	971.89	4.79	970.21	8.05	-1.68		3.26	
527+00	1-yr	1670	972.59	4.90	970.67	8.40	-1.92		3.50	
527+00	1.5-yr	1761	972.84	4.94	970.83	8.51	-2.01		3.57	
527+00	2-yr	2047	973.55	5.08	971.34	8.77	-2.21		3.69	
527+00	5-yr	3336	976.27	5.66	973.89	8.77	-2.38		3.11	
527+00	10-yr	4375	977.91	6.16	976.11	8.31	-1.80		2.15	
527+00	50-yr	7239	981.80	7.07	980.42	8.41	-1.38		1.34	
527+00	100-yr	8721	983.13	7.64	981.99	8.73	-1.14		1.09	
527+50	Avg Annual	134	966.50	2.91	966.10	5.18	-0.40		2.27	
527+50	0.5-yr	1422	971.81	4.39	969.49	9.09	-2.32		4.70	
527+50	1-yr	1670	972.51	4.56	970.05	9.17	-2.46		4.61	
527+50	1.5-yr	1761	972.75	4.62	970.24	9.21	-2.51		4.59	
527+50	2-yr	2047	973.46	4.80	970.82	9.31	-2.64		4.51	
527+50	5-yr	3336	976.17	5.44	973.50	9.04	-2.67		3.60	
527+50	10-yr	4375	977.81	5.97	975.81	8.42	-2.00		2.45	
527+50	50-yr	7239	981.67	7.03	980.18	8.37	-1.49		1.34	
527+50	100-yr	8721	982.99	7.68	981.75	8.69	-1.24		1.01	
528+00	Avg Annual	134	966.18	2.86	965.32	3.39	-0.86		0.53	
528+00	0.5-yr	1422	971.62	4.64	969.41	7.58	-2.21		2.94	
528+00	1-yr	1670	972.32	4.80	969.95	7.84	-2.37		3.04	
528+00	1.5-yr	1761	972.56	4.86	970.15	7.92	-2.41		3.06	
528+00	2-yr	2047	973.26	5.04	970.73	8.14	-2.53		3.10	
528+00	5-yr	3336	975.97	5.65	973.37	8.31	-2.60		2.66	
528+00	10-yr	4375	977.62	6.12	975.65	7.93	-1.97		1.81	
528+00	50-yr	7239	981.51	6.99	980.01	8.09	-1.50		1.10	
528+00	100-yr	8721	982.83	7.56	981.57	8.43	-1.26		0.87	
528+50	Avg Annual	134	965.94	2.64	965.18	2.94	-0.76		0.30	
528+50	0.5-yr	1422	971.45	4.38	969.27	6.92	-2.18		2.54	
528+50	1-yr	1670	972.15	4.54	969.83	7.12	-2.32		2.58	
528+50	1.5-yr	1761	972.39	4.60	970.03	7.19	-2.36		2.59	
528+50	2-yr	2047	973.10	4.78	970.64	7.36	-2.46		2.58	
528+50	5-yr	3336	975.81	5.43	973.31	7.54	-2.50		2.11	
528+50	10-yr	4375	977.42	5.90	975.58	7.28	-1.84		1.38	
528+50	50-yr	7239	981.38	6.48	979.96	7.39	-1.42		0.91	
528+50	100-yr	8721	982.70	6.98	981.53	7.67	-1.17		0.69	
529+00	Avg Annual	134	965.81	2.06	965.01	2.99	-0.80		0.93	
529+00	0.5-yr	1422	971.34	3.97	969.14	6.38	-2.20		2.41	
529+00	1-yr	1670	972.04	4.15	969.72	6.61	-2.32		2.46	
529+00	1.5-yr	1761	972.28	4.21	969.92	6.69	-2.36		2.48	
529+00	2-yr	2047	972.99	4.40	970.53	6.90	-2.46		2.50	
529+00	5-yr	3336	975.70	5.04	973.19	7.29	-2.51		2.25	
529+00	10-yr	4375	977.28	5.56	975.46	7.07	-1.82		1.51	
529+00	50-yr	7239	981.22	6.36	979.82	7.35	-1.40		0.99	
529+00	100-yr	8721	982.54	6.88	981.38	7.69	-1.16		0.81	
529+50	Avg Annual	134	965.69	2.17	964.91	2.49	-0.78		0.32	
529+50	0.5-yr	1422	971.16	4.31	968.98	6.32	-2.18		2.01	
529+50	1-yr	1670	971.85	4.47	969.56	6.54	-2.29		2.07	
529+50	1.5-yr	1761	972.10	4.53	969.76	6.61	-2.34		2.08	
529+50	2-yr	2047	972.80	4.71	970.38	6.80	-2.42		2.09	
529+50	5-yr	3336	975.49	5.38	973.06	7.13	-2.43		1.75	
529+50	10-yr	4375	977.05	5.90	975.33	6.92	-1.72		1.02	
529+50	50-yr	7239	980.99	6.63	979.69	7.14	-1.30		0.51	
529+50	100-yr	8721	982.30	7.15	981.24	7.44	-1.06		0.29	
530+00	Avg Annual	134	965.65	1.68	964.74	2.89	-0.91		1.21	
530+00	0.5-yr	1422	971.08	3.54	968.84	5.91	-2.24		2.37	
530+00	1-yr	1670	971.78	3.67	969.47	5.93	-2.31		2.26	
530+00	1.5-yr	1761	972.03	3.71	969.69	5.94	-2.34		2.23	
530+00	2-yr	2047	972.74	3.86	970.34	5.99	-2.40		2.13	
530+00	5-yr	3336	975.46	4.41	973.08	6.09	-2.38		1.68	
530+00	10-yr	4375	977.02	4.89	975.35	5.91	-1.67		1.02	
530+00	50-yr	7239	980.99	5.63	979.72	6.13	-1.27		0.50	
530+00	100-yr	8721	982.31	6.12	981.28	6.41	-1.03		0.29	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
530+50	Avg Annual	134	965.61	1.54	964.77	1.37	-0.84		-0.17	
530+50	0.5-yr	1422	970.95	3.60	968.83	4.90	-2.12		1.30	
530+50	1-yr	1670	971.66	3.73	969.44	5.11	-2.22		1.38	
530+50	1.5-yr	1761	971.90	3.77	969.65	5.17	-2.25		1.40	
530+50	2-yr	2047	972.62	3.92	970.31	5.32	-2.31		1.40	
530+50	5-yr	3336	975.34	4.45	973.02	5.73	-2.32		1.28	
530+50	10-yr	4375	976.89	4.90	975.29	5.69	-1.60		0.79	
530+50	50-yr	7239	980.89	5.51	979.63	6.02	-1.26		0.51	
530+50	100-yr	8721	982.21	5.91	981.19	6.25	-1.02		0.34	
531+00	Avg Annual	134	965.54	1.85	964.75	1.41	-0.79		-0.44	
531+00	0.5-yr	1422	970.83	3.68	968.77	4.63	-2.06		0.95	
531+00	1-yr	1670	971.53	3.82	969.37	4.83	-2.16		1.01	
531+00	1.5-yr	1761	971.78	3.87	969.59	4.89	-2.19		1.02	
531+00	2-yr	2047	972.49	4.02	970.25	5.06	-2.24		1.04	
531+00	5-yr	3336	975.21	4.55	972.96	5.49	-2.25		0.94	
531+00	10-yr	4375	976.74	5.02	975.22	5.49	-1.52		0.47	
531+00	50-yr	7239	980.75	5.58	979.53	5.85	-1.22		0.27	
531+00	100-yr	8721	982.09	5.94	981.09	6.05	-1.00		0.11	
531+50	Avg Annual	134	965.31	3.02	964.74	1.05	-0.57		-1.97	
531+50	0.5-yr	1422	970.66	3.94	968.76	4.01	-1.90		0.07	
531+50	1-yr	1670	971.37	4.05	969.37	4.23	-2.00		0.18	
531+50	1.5-yr	1761	971.62	4.09	969.58	4.31	-2.04		0.22	
531+50	2-yr	2047	972.33	4.23	970.24	4.51	-2.09		0.28	
531+50	5-yr	3336	975.05	4.76	972.93	5.08	-2.12		0.32	
531+50	10-yr	4375	976.57	5.26	975.19	5.15	-1.38		-0.11	
531+50	50-yr	7239	980.57	5.91	979.47	5.52	-1.10		-0.39	
531+50	100-yr	8721	981.90	6.30	981.03	5.72	-0.87		-0.58	
532+00	Avg Annual	134	965.36	1.00	964.73	1.00	-0.63		0.00	
532+00	0.5-yr	1422	970.65	2.80	968.75	3.50	-1.90		0.70	
532+00	1-yr	1670	971.36	2.94	969.37	3.68	-1.99		0.74	
532+00	1.5-yr	1761	971.61	2.98	969.58	3.74	-2.03		0.76	
532+00	2-yr	2047	972.33	3.13	970.24	3.90	-2.09		0.77	
532+00	5-yr	3336	975.05	3.65	972.95	4.35	-2.10		0.70	
532+00	10-yr	4375	976.57	4.06	975.20	4.38	-1.37		0.32	
532+00	50-yr	7239	980.63	4.38	979.49	4.63	-1.14		0.25	
532+00	100-yr	8721	981.97	4.68	981.05	4.80	-0.92		0.12	
532+50	Avg Annual	134	965.28	2.01	964.65	2.20	-0.63		0.19	
532+50	0.5-yr	1422	970.56	3.02	968.63	4.00	-1.93		0.98	
532+50	1-yr	1670	971.27	3.12	969.26	4.09	-2.01		0.97	
532+50	1.5-yr	1761	971.52	3.16	969.48	4.11	-2.04		0.95	
532+50	2-yr	2047	972.24	3.27	970.16	4.16	-2.08		0.89	
532+50	5-yr	3336	974.97	3.67	972.90	4.29	-2.07		0.62	
532+50	10-yr	4375	976.48	4.03	975.18	4.19	-1.30		0.16	
532+50	50-yr	7239	980.53	4.44	979.46	4.45	-1.07		0.01	
532+50	100-yr	8721	981.87	4.78	981.01	4.69	-0.86		-0.09	
533+00	Avg Annual	134	964.81	3.87	964.13	4.40	-0.68		0.53	
533+00	0.5-yr	1422	970.28	4.15	968.44	4.73	-1.84		0.58	
533+00	1-yr	1670	971.01	4.22	969.07	4.82	-1.94		0.60	
533+00	1.5-yr	1761	971.26	4.25	969.29	4.85	-1.97		0.60	
533+00	2-yr	2047	971.97	4.38	969.96	4.93	-2.01		0.55	
533+00	5-yr	3336	974.68	4.86	972.70	5.18	-1.98		0.32	
533+00	10-yr	4375	976.14	5.36	974.98	5.10	-1.16		-0.26	
533+00	50-yr	7239	980.16	5.95	979.22	5.53	-0.94		-0.42	
533+00	100-yr	8721	981.45	6.40	980.74	5.86	-0.71		-0.54	
533+50	Avg Annual	134	964.49	3.15	963.63	2.02	-0.86		-1.13	
533+50	0.5-yr	1422	970.05	4.29	968.32	4.84	-1.73		0.55	
533+50	1-yr	1670	970.79	4.37	968.93	5.05	-1.86		0.68	
533+50	1.5-yr	1761	971.05	4.40	969.15	5.12	-1.90		0.72	
533+50	2-yr	2047	971.77	4.54	969.81	5.30	-1.96		0.76	
533+50	5-yr	3336	974.47	5.07	972.50	5.79	-1.97		0.72	
533+50	10-yr	4375	975.90	5.61	974.78	5.76	-1.12		0.15	
533+50	50-yr	7239	979.95	6.15	979.00	6.12	-0.95		-0.03	
533+50	100-yr	8721	981.25	6.57	980.52	6.40	-0.73		-0.17	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
534+00	Avg Annual	134	964.51	1.49	963.59	1.81	-0.92		0.32	
534+00	0.5-yr	1422	969.98	3.70	968.19	5.05	-1.79		1.35	
534+00	1-yr	1670	970.72	3.87	968.79	5.30	-1.93		1.43	
534+00	1.5-yr	1761	970.97	3.93	969.00	5.38	-1.97		1.45	
534+00	2-yr	2047	971.68	4.12	969.66	5.60	-2.02		1.48	
534+00	5-yr	3336	974.36	4.80	972.30	6.21	-2.06		1.41	
534+00	10-yr	4375	975.77	5.40	974.58	6.19	-1.19		0.79	
534+00	50-yr	7239	979.82	6.03	978.72	6.67	-1.10		0.64	
534+00	100-yr	8721	981.11	6.47	980.26	6.86	-0.85		0.39	
534+50	Avg Annual	134	964.48	1.47	963.56	1.59	-0.92		0.12	
534+50	0.5-yr	1422	969.88	3.92	968.11	4.94	-1.77		1.02	
534+50	1-yr	1670	970.61	4.11	968.71	5.21	-1.90		1.10	
534+50	1.5-yr	1761	970.86	4.18	968.92	5.29	-1.94		1.11	
534+50	2-yr	2047	971.56	4.39	969.57	5.53	-1.99		1.14	
534+50	5-yr	3336	974.21	5.12	972.19	6.19	-2.02		1.07	
534+50	10-yr	4375	975.58	5.77	974.47	6.17	-1.11		0.40	
534+50	50-yr	7239	979.64	6.43	978.57	6.56	-1.07		0.13	
534+50	100-yr	8721	980.93	6.84	980.12	6.74	-0.81		-0.10	
535+00	Avg Annual	134	964.42	1.90	963.52	1.82	-0.90		-0.08	
535+00	0.5-yr	1422	969.76	4.14	967.95	5.26	-1.81		1.12	
535+00	1-yr	1670	970.50	4.28	968.56	5.49	-1.94		1.21	
535+00	1.5-yr	1761	970.75	4.33	968.77	5.57	-1.98		1.24	
535+00	2-yr	2047	971.45	4.52	969.43	5.76	-2.02		1.24	
535+00	5-yr	3336	974.10	5.18	972.06	6.30	-2.04		1.12	
535+00	10-yr	4375	975.46	5.81	974.36	6.19	-1.10		0.38	
535+00	50-yr	7239	979.54	6.35	978.42	6.48	-1.12		0.13	
535+00	100-yr	8721	980.84	6.71	980.00	6.60	-0.84		-0.11	
535+50	Avg Annual	134	964.29	2.52	963.46	2.06	-0.83		-0.46	
535+50	0.5-yr	1422	969.59	4.48	967.82	5.35	-1.77		0.87	
535+50	1-yr	1670	970.33	4.59	968.42	5.60	-1.91		1.01	
535+50	1.5-yr	1761	970.59	4.63	968.63	5.68	-1.96		1.05	
535+50	2-yr	2047	971.29	4.80	969.29	5.88	-2.00		1.08	
535+50	5-yr	3336	973.93	5.45	971.91	6.45	-2.02		1.00	
535+50	10-yr	4375	975.26	6.11	974.21	6.36	-1.05		0.25	
535+50	50-yr	7239	979.37	6.58	978.16	7.01	-1.21		0.43	
535+50	100-yr	8721	980.66	6.95	979.73	7.26	-0.93		0.31	
536+00	Avg Annual	134	964.16	2.39	963.38	2.19	-0.78		-0.20	
536+00	0.5-yr	1422	969.47	4.30	967.70	5.37	-1.77		1.07	
536+00	1-yr	1670	970.22	4.41	968.31	5.56	-1.91		1.15	
536+00	1.5-yr	1761	970.48	4.45	968.52	5.63	-1.96		1.18	
536+00	2-yr	2047	971.18	4.61	969.19	5.78	-1.99		1.17	
536+00	5-yr	3336	973.83	5.13	971.80	6.25	-2.03		1.12	
536+00	10-yr	4375	975.16	5.73	974.12	6.07	-1.04		0.34	
536+00	50-yr	7239	979.27	6.28	978.08	6.68	-1.19		0.40	
536+00	100-yr	8721	980.52	6.82	979.62	7.06	-0.90		0.24	
536+50	Avg Annual	134	964.12	1.61	963.29	2.25	-0.83		0.64	
536+50	0.5-yr	1422	969.41	3.75	967.56	5.44	-1.85		1.69	
536+50	1-yr	1670	970.17	3.89	968.17	5.63	-2.00		1.74	
536+50	1.5-yr	1761	970.42	3.94	968.39	5.69	-2.03		1.75	
536+50	2-yr	2047	971.12	4.13	969.06	5.84	-2.06		1.71	
536+50	5-yr	3336	973.75	4.79	971.65	6.35	-2.10		1.56	
536+50	10-yr	4375	975.06	5.45	973.98	6.19	-1.08		0.74	
536+50	50-yr	7239	979.22	5.89	977.97	6.69	-1.25		0.80	
536+50	100-yr	8721	980.49	6.26	979.54	6.91	-0.95		0.65	
537+00	Avg Annual	134	964.05	1.92	963.23	1.95	-0.82		0.03	
537+00	0.5-yr	1422	969.28	4.08	967.47	5.14	-1.81		1.06	
537+00	1-yr	1670	970.03	4.22	968.09	5.33	-1.94		1.11	
537+00	1.5-yr	1761	970.28	4.27	968.31	5.38	-1.97		1.11	
537+00	2-yr	2047	970.98	4.45	968.99	5.53	-1.99		1.08	
537+00	5-yr	3336	973.59	5.09	971.57	6.05	-2.02		0.96	
537+00	10-yr	4375	974.87	5.72	973.90	5.88	-0.97		0.16	
537+00	50-yr	7239	979.06	6.06	977.91	6.39	-1.15		0.33	
537+00	100-yr	8721	980.32	6.43	979.48	6.62	-0.84		0.19	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
537+50	Avg Annual	134	964.04	1.21	963.23	1.21	-0.81		0.00	
537+50	0.5-yr	1422	969.26	3.54	967.49	4.17	-1.77		0.63	
537+50	1-yr	1670	970.01	3.70	968.10	4.39	-1.91		0.69	
537+50	1.5-yr	1761	970.26	3.76	968.32	4.46	-1.94		0.70	
537+50	2-yr	2047	970.96	3.96	969.01	4.65	-1.95		0.69	
537+50	5-yr	3336	973.56	4.74	971.56	5.32	-2.00		0.58	
537+50	10-yr	4375	974.83	5.45	973.87	5.37	-0.96		-0.08	
537+50	50-yr	7239	978.98	6.13	977.86	6.13	-1.12		0.00	
537+50	100-yr	8721	980.20	6.64	979.42	6.46	-0.78		-0.18	
538+00	Avg Annual	134	964.03	1.21	963.20	1.52	-0.83		0.31	
538+00	0.5-yr	1422	969.20	3.59	967.31	4.82	-1.89		1.23	
538+00	1-yr	1670	969.95	3.75	967.92	5.05	-2.03		1.30	
538+00	1.5-yr	1761	970.20	3.80	968.14	5.12	-2.06		1.32	
538+00	2-yr	2047	970.90	4.00	968.82	5.31	-2.08		1.31	
538+00	5-yr	3336	973.50	4.72	971.34	6.01	-2.16		1.29	
538+00	10-yr	4375	974.77	5.39	973.68	5.86	-1.09		0.47	
538+00	50-yr	7239	978.92	5.99	977.73	6.18	-1.19		0.19	
538+00	100-yr	8721	980.13	6.50	979.30	6.39	-0.83		-0.11	
538+50	Avg Annual	134	964.00	1.31	963.17	1.50	-0.83		0.19	
538+50	0.5-yr	1422	969.15	3.42	967.23	4.73	-1.92		1.31	
538+50	1-yr	1670	969.90	3.56	967.84	4.95	-2.06		1.39	
538+50	1.5-yr	1761	970.15	3.61	968.06	5.02	-2.09		1.41	
538+50	2-yr	2047	970.85	3.79	968.74	5.20	-2.11		1.41	
538+50	5-yr	3336	973.44	4.40	971.24	5.91	-2.20		1.51	
538+50	10-yr	4375	974.71	4.98	973.55	5.85	-1.16		0.87	
538+50	50-yr	7239	978.86	5.48	977.55	6.35	-1.31		0.87	
538+50	100-yr	8721	980.07	5.97	979.10	6.64	-0.97		0.67	
539+00	Avg Annual	134	963.93	1.92	963.11	1.84	-0.82		-0.08	
539+00	0.5-yr	1422	969.04	3.76	967.07	5.07	-1.97		1.31	
539+00	1-yr	1670	969.80	3.87	967.70	5.25	-2.10		1.38	
539+00	1.5-yr	1761	970.05	3.91	967.92	5.31	-2.13		1.40	
539+00	2-yr	2047	970.75	4.07	968.61	5.44	-2.14		1.37	
539+00	5-yr	3336	973.32	4.69	971.11	6.04	-2.21		1.35	
539+00	10-yr	4375	974.55	5.34	973.43	5.95	-1.12		0.61	
539+00	50-yr	7239	978.69	5.91	977.37	6.61	-1.32		0.70	
539+00	100-yr	8721	979.86	6.46	978.90	6.97	-0.96		0.51	
539+50	Avg Annual	134	963.79	2.29	962.68	4.53	-1.11		2.24	
539+50	0.5-yr	1422	968.99	3.57	966.91	5.33	-2.08		1.76	
539+50	1-yr	1670	969.75	3.61	967.55	5.40	-2.20		1.79	
539+50	1.5-yr	1761	970.01	3.63	967.78	5.40	-2.23		1.77	
539+50	2-yr	2047	970.71	3.75	968.52	5.33	-2.19		1.58	
539+50	5-yr	3336	973.31	4.24	971.08	5.52	-2.23		1.28	
539+50	10-yr	4375	974.54	4.82	973.44	5.30	-1.10		0.48	
539+50	50-yr	7239	978.69	5.38	977.40	5.87	-1.29		0.49	
539+50	100-yr	8721	979.87	5.88	978.94	6.21	-0.93		0.33	
540+00	Avg Annual	134	963.73	1.62	962.29	2.67	-1.44		1.05	
540+00	0.5-yr	1422	968.95	3.32	966.91	4.30	-2.04		0.98	
540+00	1-yr	1670	969.71	3.39	967.56	4.40	-2.15		1.01	
540+00	1.5-yr	1761	969.97	3.42	967.78	4.44	-2.19		1.02	
540+00	2-yr	2047	970.67	3.56	968.52	4.47	-2.15		0.91	
540+00	5-yr	3336	973.27	4.08	971.09	4.87	-2.18		0.79	
540+00	10-yr	4375	974.50	4.65	973.44	4.81	-1.06		0.16	
540+00	50-yr	7239	978.67	5.15	977.41	5.45	-1.26		0.30	
540+00	100-yr	8721	979.86	5.57	978.95	5.78	-0.91		0.21	
540+50	Avg Annual	134	963.62	2.18	962.26	1.61	-1.36		-0.57	
540+50	0.5-yr	1422	968.83	3.73	966.83	4.27	-2.00		0.54	
540+50	1-yr	1670	969.61	3.75	967.47	4.45	-2.14		0.70	
540+50	1.5-yr	1761	969.87	3.77	967.69	4.51	-2.18		0.74	
540+50	2-yr	2047	970.58	3.88	968.42	4.60	-2.16		0.72	
540+50	5-yr	3336	973.18	4.35	971.00	5.02	-2.18		0.67	
540+50	10-yr	4375	974.40	4.90	973.37	4.94	-1.03		0.04	
540+50	50-yr	7239	978.63	5.12	977.36	5.46	-1.27		0.34	
540+50	100-yr	8721	979.82	5.51	978.92	5.74	-0.90		0.23	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
540+75	Avg Annual	134	963.56	1.93	962.20	2.17	-1.36		0.24	
540+75	0.5-yr	1422	968.78	3.70	966.77	4.46	-2.01		0.76	
540+75	1-yr	1670	969.56	3.79	967.41	4.62	-2.15		0.83	
540+75	1.5-yr	1761	969.82	3.83	967.63	4.68	-2.19		0.85	
540+75	2-yr	2047	970.52	3.98	968.36	4.79	-2.16		0.81	
540+75	5-yr	3336	973.09	4.64	970.89	5.43	-2.20		0.79	
540+75	10-yr	4375	974.26	5.36	973.25	5.46	-1.01		0.10	
540+75	50-yr	7239	978.39	6.14	977.14	6.39	-1.25		0.25	
540+75	100-yr	8721	979.52	6.74	978.64	6.87	-0.88		0.13	
541+00	Avg Annual	134	963.48	2.19	962.13	2.29	-1.35		0.10	
541+00	0.5-yr	1422	968.62	4.24	966.72	4.50	-1.90		0.26	
541+00	1-yr	1670	969.41	4.24	967.37	4.66	-2.04		0.42	
541+00	1.5-yr	1761	969.67	4.25	967.58	4.71	-2.09		0.46	
541+00	2-yr	2047	970.39	4.26	968.31	4.82	-2.08		0.56	
541+00	5-yr	3336	973.03	4.51	970.87	5.22	-2.16		0.71	
541+00	10-yr	4375	974.21	5.07	973.26	5.00	-0.95		-0.07	
541+00	50-yr	7239	978.41	5.36	977.22	5.46	-1.19		0.10	
541+00	100-yr	8721	979.58	5.75	978.75	5.71	-0.83		-0.04	
541+50	Avg Annual	134	963.35	2.16	962.05	1.99	-1.30		-0.17	
541+50	0.5-yr	1422	968.53	3.40	966.68	4.15	-1.85		0.75	
541+50	1-yr	1670	969.33	3.41	967.33	4.23	-2.00		0.82	
541+50	1.5-yr	1761	969.59	3.43	967.55	4.26	-2.04		0.83	
541+50	2-yr	2047	970.30	3.53	968.30	4.29	-2.00		0.76	
541+50	5-yr	3336	972.95	3.97	970.86	4.66	-2.09		0.69	
541+50	10-yr	4375	974.11	4.55	973.24	4.56	-0.87		0.01	
541+50	50-yr	7239	978.32	4.95	977.18	5.15	-1.14		0.20	
541+50	100-yr	8721	979.48	5.33	978.71	5.45	-0.77		0.12	
542+00	Avg Annual	134	962.98	3.26	962.03	1.43	-0.95		-1.83	
542+00	0.5-yr	1422	968.35	3.61	966.65	3.67	-1.70		0.06	
542+00	1-yr	1670	969.17	3.60	967.30	3.79	-1.87		0.19	
542+00	1.5-yr	1761	969.43	3.61	967.53	3.83	-1.90		0.22	
542+00	2-yr	2047	970.15	3.70	968.28	3.90	-1.87		0.20	
542+00	5-yr	3336	972.81	4.09	970.83	4.37	-1.98		0.28	
542+00	10-yr	4375	973.95	4.68	973.21	4.33	-0.74		-0.35	
542+00	50-yr	7239	978.18	5.05	977.14	4.97	-1.04		-0.08	
542+00	100-yr	8721	979.34	5.45	978.67	5.28	-0.67		-0.17	
542+50	Avg Annual	134	962.41	3.19	961.88	2.66	-0.53		-0.53	
542+50	0.5-yr	1422	968.20	3.55	966.47	4.51	-1.73		0.96	
542+50	1-yr	1670	969.04	3.55	967.12	4.58	-1.92		1.03	
542+50	1.5-yr	1761	969.30	3.58	967.35	4.60	-1.95		1.02	
542+50	2-yr	2047	970.02	3.69	968.11	4.60	-1.91		0.91	
542+50	5-yr	3336	972.68	4.17	970.66	4.99	-2.02		0.82	
542+50	10-yr	4375	973.77	4.81	973.07	4.85	-0.70		0.04	
542+50	50-yr	7239	978.02	5.26	976.97	5.50	-1.05		0.24	
542+50	100-yr	8721	979.17	5.68	978.50	5.79	-0.67		0.11	
542+60	Avg Annual	134	962.38	2.63	961.57	4.49	-0.81		1.86	
542+60	0.5-yr	1422	968.19	3.35	966.42	4.66	-1.77		1.31	
542+60	1-yr	1670	969.03	3.37	967.07	4.77	-1.96		1.40	
542+60	1.5-yr	1761	969.29	3.40	967.30	4.81	-1.99		1.41	
542+60	2-yr	2047	970.01	3.52	968.05	4.87	-1.96		1.35	
542+60	5-yr	3336	972.67	4.01	970.56	5.49	-2.11		1.48	
542+60	10-yr	4375	973.76	4.64	972.94	5.48	-0.82		0.84	
542+60	50-yr	7239	978.02	5.10	976.76	6.46	-1.26		1.36	
542+60	100-yr	8721	979.17	5.51	978.22	6.99	-0.95		1.48	
542+88	Avg Annual	134	962.30	2.15	961.42	2.90	-0.88		0.75	
542+88	0.5-yr	1422	968.13	3.50	966.42	4.21	-1.71		0.71	
542+88	1-yr	1670	968.96	3.67	967.06	4.45	-1.90		0.78	
542+88	1.5-yr	1761	969.21	3.75	967.28	4.53	-1.93		0.78	
542+88	2-yr	2047	969.91	4.00	968.03	4.73	-1.88		0.73	
542+88	5-yr	3336	972.47	5.04	970.45	5.80	-2.02		0.76	
542+88	10-yr	4375	973.45	6.08	972.77	6.14	-0.68		0.06	
542+88	50-yr	7239	977.44	7.51	976.39	7.82	-1.05		0.31	
542+88	100-yr	8721	978.46	8.23	977.76	8.53	-0.70		0.30	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
Dawes Ave	Dawes Avenue Bridge									
543+40 Avg Annual	134	962.08	1.92	961.28	2.21	-0.80		0.29		
543+40 0.5-yr	1422	968.10	3.35	966.39	3.92	-1.71		0.57		
543+40 1-yr	1670	968.93	3.53	967.03	4.17	-1.90		0.64		
543+40 1.5-yr	1761	969.18	3.61	967.25	4.26	-1.93		0.65		
543+40 2-yr	2047	969.87	3.87	968.00	4.48	-1.87		0.61		
543+40 5-yr	3336	971.73	5.22	970.42	5.56	-1.31		0.34		
543+40 10-yr	4375	972.78	6.24	971.61	6.53	-1.17		0.29		
543+40 50-yr	7239	975.30	8.52	974.34	8.71	-0.96		0.19		
543+40 100-yr	8721	976.13	9.70	975.35	9.79	-0.78		0.09		
543+43 Avg Annual	134	962.04	2.40	961.26	2.30	-0.78		-0.10		
543+43 0.5-yr	1422	968.08	3.48	966.41	3.63	-1.67		0.15		
543+43 1-yr	1670	968.92	3.54	967.06	3.81	-1.86		0.27		
543+43 1.5-yr	1761	969.18	3.59	967.28	3.87	-1.90		0.28		
543+43 2-yr	2047	969.88	3.76	968.04	4.01	-1.84		0.25		
543+43 5-yr	3336	971.77	4.83	970.50	4.79	-1.27		-0.04		
543+43 10-yr	4375	972.86	5.64	971.74	5.52	-1.12		-0.12		
543+43 50-yr	7239	975.51	7.35	974.62	7.11	-0.89		-0.24		
543+43 100-yr	8721	976.43	8.25	975.72	7.89	-0.71		-0.36		
543+50 Avg Annual	134	962.02	2.38	961.23	2.38	-0.79		0.00		
543+50 0.5-yr	1422	968.11	2.99	966.39	3.80	-1.72		0.81		
543+50 1-yr	1670	968.95	3.07	967.04	3.97	-1.91		0.90		
543+50 1.5-yr	1761	969.21	3.11	967.26	4.03	-1.95		0.92		
543+50 2-yr	2047	969.92	3.26	968.02	4.16	-1.90		0.90		
543+50 5-yr	3336	971.83	4.11	970.50	4.79	-1.33		0.68		
543+50 10-yr	4375	972.95	4.73	971.76	5.39	-1.19		0.66		
543+50 50-yr	7239	975.68	5.89	974.70	6.53	-0.98		0.64		
543+50 100-yr	8721	976.66	6.48	975.86	7.08	-0.80		0.60		
544+00 Avg Annual	134	961.83	2.39	961.01	2.87	-0.82		0.48		
544+00 0.5-yr	1422	968.05	3.04	966.32	3.91	-1.73		0.87		
544+00 1-yr	1670	968.89	3.11	966.97	4.08	-1.92		0.97		
544+00 1.5-yr	1761	969.15	3.15	967.19	4.14	-1.96		0.99		
544+00 2-yr	2047	969.85	3.32	967.95	4.25	-1.90		0.93		
544+00 5-yr	3336	971.74	4.24	970.43	4.86	-1.31		0.62		
544+00 10-yr	4375	972.82	4.91	971.65	5.50	-1.17		0.59		
544+00 50-yr	7239	975.55	6.07	974.53	6.72	-1.02		0.65		
544+00 100-yr	8721	976.62	6.10	975.71	7.16	-0.91		1.06		
544+50 Avg Annual	134	961.61	2.65	960.96	1.83	-0.65		-0.82		
544+50 0.5-yr	1422	967.96	3.22	966.29	3.72	-1.67		0.50		
544+50 1-yr	1670	968.80	3.33	966.93	3.93	-1.87		0.60		
544+50 1.5-yr	1761	969.05	3.39	967.16	4.00	-1.89		0.61		
544+50 2-yr	2047	969.74	3.59	967.92	4.15	-1.82		0.56		
544+50 5-yr	3336	971.55	4.70	970.34	4.95	-1.21		0.25		
544+50 10-yr	4375	972.60	5.44	971.53	5.68	-1.07		0.24		
544+50 50-yr	7239	975.30	6.49	974.38	6.89	-0.92		0.40		
544+50 100-yr	8721	976.37	6.62	975.59	7.17	-0.78		0.55		
545+00 Avg Annual	134	961.59	1.46	960.83	2.48	-0.76		1.02		
545+00 0.5-yr	1422	967.91	3.08	966.22	3.91	-1.69		0.83		
545+00 1-yr	1670	968.75	3.21	966.86	4.10	-1.89		0.89		
545+00 1.5-yr	1761	969.00	3.27	967.09	4.17	-1.91		0.90		
545+00 2-yr	2047	969.69	3.47	967.85	4.30	-1.84		0.83		
545+00 5-yr	3336	971.49	4.46	970.27	5.04	-1.22		0.58		
545+00 10-yr	4375	972.56	4.95	971.47	5.67	-1.09		0.72		
545+00 50-yr	7239	975.38	5.11	974.45	6.15	-0.93		1.04		
545+00 100-yr	8721	976.47	5.08	975.69	6.21	-0.78		1.13		
545+50 Avg Annual	134	961.57	1.10	960.76	1.90	-0.81		0.80		
545+50 0.5-yr	1422	967.87	2.81	966.20	3.59	-1.67		0.78		
545+50 1-yr	1670	968.71	2.94	966.85	3.79	-1.86		0.85		
545+50 1.5-yr	1761	968.96	3.01	967.07	3.86	-1.89		0.85		
545+50 2-yr	2047	969.65	3.20	967.83	4.00	-1.82		0.80		
545+50 5-yr	3336	971.48	3.85	970.26	4.63	-1.22		0.78		
545+50 10-yr	4375	972.57	4.09	971.50	5.00	-1.07		0.91		
545+50 50-yr	7239	975.41	4.00	974.52	5.18	-0.89		1.18		
545+50 100-yr	8721	976.48	3.97	975.77	5.16	-0.71		1.19		

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
546+00	Avg Annual	134	961.52	1.61	960.75	1.46	-0.77		-0.15	
546+00	0.5-yr	1422	967.73	3.44	966.13	3.85	-1.60		0.41	
546+00	1-yr	1670	968.56	3.51	966.77	4.08	-1.79		0.57	
546+00	1.5-yr	1761	968.82	3.54	966.99	4.16	-1.83		0.62	
546+00	2-yr	2047	969.52	3.62	967.75	4.32	-1.77		0.70	
546+00	5-yr	3336	971.40	3.70	970.16	4.96	-1.24		1.26	
546+00	10-yr	4375	972.49	3.73	971.44	5.14	-1.05		1.41	
546+00	50-yr	7239	975.36	3.46	974.50	5.07	-0.86		1.61	
546+00	100-yr	8721	976.44	3.59	975.76	5.06	-0.68		1.47	
546+50	Avg Annual	134	961.46	1.71	960.49	3.71	-0.97		2.00	
546+50	0.5-yr	1422	967.62	3.59	965.97	4.56	-1.65		0.97	
546+50	1-yr	1670	968.44	3.64	966.60	4.78	-1.84		1.14	
546+50	1.5-yr	1761	968.70	3.65	966.82	4.85	-1.88		1.20	
546+50	2-yr	2047	969.40	3.60	967.58	4.96	-1.82		1.36	
546+50	5-yr	3336	971.31	3.67	970.07	5.14	-1.24		1.47	
546+50	10-yr	4375	972.42	3.83	971.38	5.24	-1.04		1.41	
546+50	50-yr	7239	975.34	3.77	974.46	5.22	-0.88		1.45	
546+50	100-yr	8721	976.43	3.86	975.73	5.19	-0.70		1.33	
547+00	Avg Annual	134	961.40	1.70	960.52	1.82	-0.88		0.12	
547+00	0.5-yr	1422	967.55	3.52	965.93	4.30	-1.62		0.78	
547+00	1-yr	1670	968.39	3.47	966.56	4.56	-1.83		1.09	
547+00	1.5-yr	1761	968.65	3.45	966.78	4.64	-1.87		1.19	
547+00	2-yr	2047	969.35	3.27	967.54	4.78	-1.81		1.51	
547+00	5-yr	3336	971.31	2.93	970.09	4.61	-1.22		1.68	
547+00	10-yr	4375	972.43	2.89	971.43	4.47	-1.00		1.58	
547+00	50-yr	7239	975.36	2.69	974.54	4.12	-0.82		1.43	
547+00	100-yr	8721	976.45	2.79	975.80	4.09	-0.65		1.30	
547+50	Avg Annual	134	961.35	1.59	960.50	1.51	-0.85		-0.08	
547+50	0.5-yr	1422	967.48	3.38	965.91	3.95	-1.57		0.57	
547+50	1-yr	1670	968.32	3.28	966.54	4.18	-1.78		0.90	
547+50	1.5-yr	1761	968.59	3.23	966.76	4.26	-1.83		1.03	
547+50	2-yr	2047	969.29	3.06	967.52	4.39	-1.77		1.33	
547+50	5-yr	3336	971.26	2.68	970.08	3.99	-1.18		1.31	
547+50	10-yr	4375	972.40	2.57	971.43	3.73	-0.97		1.16	
547+50	50-yr	7239	975.35	2.33	974.55	3.31	-0.80		0.98	
547+50	100-yr	8721	976.44	2.39	975.81	3.28	-0.63		0.89	
548+00	Avg Annual	134	961.30	1.54	960.49	1.24	-0.81		-0.30	
548+00	0.5-yr	1422	967.42	3.05	965.91	3.40	-1.51		0.35	
548+00	1-yr	1670	968.27	2.89	966.54	3.60	-1.73		0.71	
548+00	1.5-yr	1761	968.54	2.78	966.77	3.65	-1.77		0.87	
548+00	2-yr	2047	969.25	2.59	967.54	3.67	-1.71		1.08	
548+00	5-yr	3336	971.24	2.39	970.11	3.39	-1.13		1.00	
548+00	10-yr	4375	972.39	2.40	971.44	3.39	-0.95		0.99	
548+00	50-yr	7239	975.34	2.30	974.55	3.35	-0.79		1.05	
548+00	100-yr	8721	976.43	2.38	975.81	3.40	-0.62		1.02	
548+50	Avg Annual	134	961.28	1.19	960.47	1.25	-0.81		0.06	
548+50	0.5-yr	1422	967.37	2.86	965.88	3.29	-1.49		0.43	
548+50	1-yr	1670	968.19	2.87	966.52	3.50	-1.67		0.63	
548+50	1.5-yr	1761	968.45	2.87	966.74	3.57	-1.71		0.70	
548+50	2-yr	2047	969.15	2.87	967.49	3.70	-1.66		0.83	
548+50	5-yr	3336	971.16	2.98	969.99	3.99	-1.17		1.01	
548+50	10-yr	4375	972.31	3.09	971.32	4.10	-0.99		1.01	
548+50	50-yr	7239	975.29	3.08	974.45	4.11	-0.84		1.03	
548+50	100-yr	8721	976.38	3.21	975.72	4.18	-0.66		0.97	
549+00	Avg Annual	134	961.27	0.95	960.47	0.95	-0.80		0.00	
549+00	0.5-yr	1422	967.32	2.86	965.87	3.11	-1.45		0.25	
549+00	1-yr	1670	968.14	2.84	966.50	3.33	-1.64		0.49	
549+00	1.5-yr	1761	968.40	2.80	966.72	3.40	-1.68		0.60	
549+00	2-yr	2047	969.12	2.69	967.47	3.56	-1.65		0.87	
549+00	5-yr	3336	971.14	2.62	969.98	3.85	-1.16		1.23	
549+00	10-yr	4375	972.29	2.71	971.31	4.01	-0.98		1.30	
549+00	50-yr	7239	975.27	2.76	974.44	4.13	-0.83		1.37	
549+00	100-yr	8721	976.37	2.87	975.70	4.20	-0.67		1.33	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
549+50	Avg Annual	134	961.26	0.82	960.47	0.67	-0.79		-0.15	
549+50	0.5-yr	1422	967.29	2.62	965.88	2.53	-1.41		-0.09	
549+50	1-yr	1670	968.10	2.72	966.52	2.73	-1.58		0.01	
549+50	1.5-yr	1761	968.35	2.76	966.74	2.80	-1.61		0.04	
549+50	2-yr	2047	969.05	2.89	967.49	2.94	-1.56		0.05	
549+50	5-yr	3336	971.00	3.48	969.98	3.45	-1.02		-0.03	
549+50	10-yr	4375	972.13	3.81	971.29	3.84	-0.84		0.03	
549+50	50-yr	7239	975.13	4.00	974.35	4.39	-0.78		0.39	
549+50	100-yr	8721	976.23	4.11	975.61	4.56	-0.62		0.45	
550+00	Avg Annual	134	961.22	1.50	960.44	1.41	-0.78		-0.09	
550+00	0.5-yr	1422	967.14	3.52	965.67	4.14	-1.47		0.62	
550+00	1-yr	1670	967.96	3.52	966.28	4.41	-1.68		0.89	
550+00	1.5-yr	1761	968.22	3.53	966.50	4.50	-1.72		0.97	
550+00	2-yr	2047	968.93	3.58	967.24	4.65	-1.69		1.07	
550+00	5-yr	3336	970.92	3.89	969.75	4.89	-1.17		1.00	
550+00	10-yr	4375	972.06	4.10	971.11	4.97	-0.95		0.87	
550+00	50-yr	7239	975.08	4.23	974.27	4.94	-0.81		0.71	
550+00	100-yr	8721	976.17	4.41	975.54	5.01	-0.63		0.60	
550+50	Avg Annual	134	961.13	2.15	960.28	3.00	-0.85		0.85	
550+50	0.5-yr	1422	967.00	3.96	965.48	4.93	-1.52		0.97	
550+50	1-yr	1670	967.80	4.05	966.09	5.17	-1.71		1.12	
550+50	1.5-yr	1761	968.06	4.09	966.30	5.25	-1.76		1.16	
550+50	2-yr	2047	968.74	4.20	967.01	5.41	-1.73		1.21	
550+50	5-yr	3336	970.73	4.52	969.51	5.69	-1.22		1.17	
550+50	10-yr	4375	971.86	4.78	970.84	5.91	-1.02		1.13	
550+50	50-yr	7239	974.90	4.84	974.02	5.97	-0.88		1.13	
550+50	100-yr	8721	975.99	5.00	975.31	5.95	-0.68		0.95	
551+00	Avg Annual	134	961.05	1.98	960.17	2.37	-0.88		0.39	
551+00	0.5-yr	1422	966.97	3.44	965.44	4.53	-1.53		1.09	
551+00	1-yr	1670	967.77	3.50	966.05	4.75	-1.72		1.25	
551+00	1.5-yr	1761	968.03	3.52	966.26	4.83	-1.77		1.31	
551+00	2-yr	2047	968.71	3.60	966.96	4.96	-1.75		1.36	
551+00	5-yr	3336	970.72	3.79	969.52	4.98	-1.20		1.19	
551+00	10-yr	4375	971.86	3.97	970.89	4.99	-0.97		1.02	
551+00	50-yr	7239	974.91	3.94	974.09	4.84	-0.82		0.90	
551+00	100-yr	8721	975.99	4.07	975.37	4.82	-0.64		0.75	
551+50	Avg Annual	134	961.01	1.44	960.14	1.71	-0.87		0.27	
551+50	0.5-yr	1422	966.96	2.97	965.44	3.83	-1.52		0.86	
551+50	1-yr	1670	967.75	3.10	966.05	4.05	-1.70		0.95	
551+50	1.5-yr	1761	968.00	3.14	966.26	4.12	-1.74		0.98	
551+50	2-yr	2047	968.66	3.30	966.96	4.30	-1.70		1.00	
551+50	5-yr	3336	970.62	3.95	969.46	4.83	-1.16		0.88	
551+50	10-yr	4375	971.73	4.31	970.76	5.20	-0.97		0.89	
551+50	50-yr	7239	974.78	4.54	973.91	5.45	-0.87		0.91	
551+50	100-yr	8721	975.87	4.73	975.18	5.57	-0.69		0.84	
552+00	Avg Annual	134	960.87	2.44	960.00	2.65	-0.87		0.21	
552+00	0.5-yr	1422	966.87	3.36	965.33	4.21	-1.54		0.85	
552+00	1-yr	1670	967.66	3.48	965.94	4.42	-1.72		0.94	
552+00	1.5-yr	1761	967.91	3.52	966.15	4.49	-1.76		0.97	
552+00	2-yr	2047	968.55	3.72	966.85	4.64	-1.70		0.92	
552+00	5-yr	3336	970.43	4.73	969.31	5.30	-1.12		0.57	
552+00	10-yr	4375	971.43	5.51	970.52	5.99	-0.91		0.48	
552+00	50-yr	7239	974.25	6.67	973.39	7.26	-0.86		0.59	
552+00	100-yr	8721	975.31	6.98	974.58	7.62	-0.73		0.64	
552+50	Avg Annual	134	960.78	1.79	959.86	2.38	-0.92		0.59	
552+50	0.5-yr	1422	966.85	3.07	965.33	3.60	-1.52		0.53	
552+50	1-yr	1670	967.62	3.21	965.95	3.79	-1.67		0.58	
552+50	1.5-yr	1761	967.87	3.27	966.16	3.86	-1.71		0.59	
552+50	2-yr	2047	968.52	3.48	966.86	4.01	-1.66		0.53	
552+50	5-yr	3336	970.37	4.47	969.33	4.65	-1.04		0.18	
552+50	10-yr	4375	971.36	5.23	970.55	5.28	-0.81		0.05	
552+50	50-yr	7239	974.10	6.54	973.41	6.57	-0.69		0.03	
552+50	100-yr	8721	975.12	6.89	974.51	7.10	-0.61		0.21	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
553+00	Avg Annual	134	960.72	1.55	959.78	1.95	-0.94		0.40	
553+00	0.5-yr	1422	966.81	3.03	965.30	3.48	-1.51		0.45	
553+00	1-yr	1670	967.58	3.16	965.91	3.68	-1.67		0.52	
553+00	1.5-yr	1761	967.83	3.22	966.12	3.75	-1.71		0.53	
553+00	2-yr	2047	968.47	3.42	966.82	3.92	-1.65		0.50	
553+00	5-yr	3336	970.30	4.43	969.29	4.58	-1.01		0.15	
553+00	10-yr	4375	971.27	5.20	970.51	5.22	-0.76		0.02	
553+00	50-yr	7239	973.97	6.42	973.35	6.46	-0.62		0.04	
553+00	100-yr	8721	974.98	6.62	974.44	6.87	-0.54		0.25	
553+50	Avg Annual	134	960.69	1.46	959.77	1.29	-0.92		-0.17	
553+50	0.5-yr	1422	966.76	2.95	965.30	3.07	-1.46		0.12	
553+50	1-yr	1670	967.54	3.04	965.91	3.27	-1.63		0.23	
553+50	1.5-yr	1761	967.79	3.08	966.12	3.34	-1.67		0.26	
553+50	2-yr	2047	968.43	3.23	966.82	3.52	-1.61		0.29	
553+50	5-yr	3336	970.28	3.95	969.29	4.13	-0.99		0.18	
553+50	10-yr	4375	971.27	4.44	970.53	4.56	-0.74		0.12	
553+50	50-yr	7239	974.06	5.01	973.47	5.17	-0.59		0.16	
553+50	100-yr	8721	975.02	5.49	974.57	5.46	-0.45		-0.03	
554+00	Avg Annual	134	960.66	1.36	959.74	1.36	-0.92		0.00	
554+00	0.5-yr	1422	966.68	3.26	965.18	3.77	-1.50		0.51	
554+00	1-yr	1670	967.45	3.40	965.78	4.03	-1.67		0.63	
554+00	1.5-yr	1761	967.69	3.47	965.99	4.11	-1.70		0.64	
554+00	2-yr	2047	968.32	3.69	966.68	4.33	-1.64		0.64	
554+00	5-yr	3336	970.10	4.71	969.09	5.04	-1.01		0.33	
554+00	10-yr	4375	971.08	5.28	970.34	5.16	-0.74		-0.12	
554+00	50-yr	7239	973.92	5.69	973.40	5.05	-0.52		-0.64	
554+00	100-yr	8721	974.88	6.09	974.50	5.23	-0.38		-0.86	
554+50	Avg Annual	134	960.64	1.39	959.73	1.35	-0.91		-0.04	
554+50	0.5-yr	1422	966.60	3.45	965.08	4.13	-1.52		0.68	
554+50	1-yr	1670	967.36	3.63	965.67	4.43	-1.69		0.80	
554+50	1.5-yr	1761	967.60	3.71	965.87	4.53	-1.73		0.82	
554+50	2-yr	2047	968.22	3.98	966.55	4.78	-1.67		0.80	
554+50	5-yr	3336	969.92	5.14	968.88	5.73	-1.04		0.59	
554+50	10-yr	4375	970.90	5.58	969.94	6.51	-0.96		0.93	
554+50	50-yr	7239	973.82	5.45	973.17	6.21	-0.65		0.76	
554+50	100-yr	8721	974.79	5.66	974.30	6.32	-0.49		0.66	
555+00	Avg Annual	134	960.60	1.55	959.71	1.37	-0.89		-0.18	
555+00	0.5-yr	1422	966.53	3.53	965.02	4.19	-1.51		0.66	
555+00	1-yr	1670	967.29	3.67	965.60	4.49	-1.69		0.82	
555+00	1.5-yr	1761	967.53	3.73	965.80	4.59	-1.73		0.86	
555+00	2-yr	2047	968.14	3.94	966.48	4.82	-1.66		0.88	
555+00	5-yr	3336	969.81	4.91	968.78	5.65	-1.03		0.74	
555+00	10-yr	4375	970.80	5.26	969.82	6.31	-0.98		1.05	
555+00	50-yr	7239	973.77	5.14	973.13	5.88	-0.64		0.74	
555+00	100-yr	8721	974.74	5.37	974.27	6.02	-0.47		0.65	
555+50	Avg Annual	134	960.59	1.37	959.69	1.40	-0.90		0.03	
555+50	0.5-yr	1422	966.46	3.61	964.95	4.29	-1.51		0.68	
555+50	1-yr	1670	967.21	3.78	965.52	4.60	-1.69		0.82	
555+50	1.5-yr	1761	967.45	3.84	965.72	4.70	-1.73		0.86	
555+50	2-yr	2047	968.05	4.07	966.39	4.95	-1.66		0.88	
555+50	5-yr	3336	969.65	5.24	968.64	5.86	-1.01		0.62	
555+50	10-yr	4375	970.52	6.03	969.61	6.72	-0.91		0.69	
555+50	50-yr	7239	973.51	6.20	972.84	6.85	-0.67		0.65	
555+50	100-yr	8721	974.48	6.48	974.00	6.97	-0.48		0.49	
556+00	Avg Annual	134	960.57	1.32	959.68	1.28	-0.89		-0.04	
556+00	0.5-yr	1422	966.41	3.51	964.92	4.04	-1.49		0.53	
556+00	1-yr	1670	967.16	3.67	965.49	4.34	-1.67		0.67	
556+00	1.5-yr	1761	967.39	3.73	965.69	4.44	-1.70		0.71	
556+00	2-yr	2047	967.98	3.98	966.36	4.68	-1.62		0.70	
556+00	5-yr	3336	969.63	4.69	968.60	5.57	-1.03		0.88	
556+00	10-yr	4375	970.56	5.02	969.62	6.11	-0.94		1.09	
556+00	50-yr	7239	973.58	4.73	972.93	5.80	-0.65		1.07	
556+00	100-yr	8721	974.56	4.91	974.07	5.97	-0.49		1.06	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
556+50	Avg Annual	134	960.55	1.23	959.67	1.15	-0.88		-0.08	
556+50	0.5-yr	1422	966.38	3.23	964.92	3.44	-1.46		0.21	
556+50	1-yr	1670	967.14	3.28	965.50	3.69	-1.64		0.41	
556+50	1.5-yr	1761	967.37	3.29	965.70	3.78	-1.67		0.49	
556+50	2-yr	2047	967.98	3.36	966.38	3.98	-1.60		0.62	
556+50	5-yr	3336	969.65	3.87	968.69	4.29	-0.96		0.42	
556+50	10-yr	4375	970.57	4.24	969.74	4.63	-0.83		0.39	
556+50	50-yr	7239	973.59	4.17	973.02	4.45	-0.57		0.28	
556+50	100-yr	8721	974.57	4.36	974.17	4.55	-0.40		0.19	
557+00	Avg Annual	134	960.53	1.39	959.65	1.34	-0.88		-0.05	
557+00	0.5-yr	1422	966.35	3.12	964.89	3.48	-1.46		0.36	
557+00	1-yr	1670	967.10	3.12	965.46	3.73	-1.64		0.61	
557+00	1.5-yr	1761	967.34	3.12	965.66	3.81	-1.68		0.69	
557+00	2-yr	2047	967.96	3.15	966.34	4.00	-1.62		0.85	
557+00	5-yr	3336	969.65	3.37	968.67	4.11	-0.98		0.74	
557+00	10-yr	4375	970.58	3.60	969.74	4.25	-0.84		0.65	
557+00	50-yr	7239	973.61	3.58	973.03	3.98	-0.58		0.40	
557+00	100-yr	8721	974.58	3.79	974.19	4.12	-0.39		0.33	
557+50	Avg Annual	134	960.49	1.44	959.61	1.63	-0.88		0.19	
557+50	0.5-yr	1422	966.30	3.15	964.82	3.69	-1.48		0.54	
557+50	1-yr	1670	967.07	3.07	965.39	3.94	-1.68		0.87	
557+50	1.5-yr	1761	967.31	3.02	965.59	4.03	-1.72		1.01	
557+50	2-yr	2047	967.94	2.88	966.25	4.05	-1.69		1.17	
557+50	5-yr	3336	969.65	2.86	968.68	2.86	-0.97		0.00	
557+50	10-yr	4375	970.59	3.02	969.77	2.75	-0.82		-0.27	
557+50	50-yr	7239	973.62	2.83	973.07	2.19	-0.55		-0.64	
557+50	100-yr	8721	974.61	2.90	974.23	2.15	-0.38		-0.75	
558+00	Avg Annual	134	960.46	1.39	959.58	1.48	-0.88		0.09	
558+00	0.5-yr	1422	966.22	3.22	964.78	3.65	-1.44		0.43	
558+00	1-yr	1670	966.96	3.33	965.35	3.91	-1.61		0.58	
558+00	1.5-yr	1761	967.20	3.35	965.55	4.00	-1.65		0.65	
558+00	2-yr	2047	967.81	3.33	966.13	4.25	-1.68		0.92	
558+00	5-yr	3336	969.55	3.36	968.42	4.45	-1.13		1.09	
558+00	10-yr	4375	970.49	3.48	969.55	4.49	-0.94		1.01	
558+00	50-yr	7239	973.57	3.07	972.95	3.87	-0.62		0.80	
558+00	100-yr	8721	974.56	3.06	974.14	3.75	-0.42		0.69	
558+50	Avg Annual	134	960.44	1.28	959.54	1.64	-0.90		0.36	
558+50	0.5-yr	1422	966.16	3.13	964.75	3.56	-1.41		0.43	
558+50	1-yr	1670	966.89	3.24	965.32	3.80	-1.57		0.56	
558+50	1.5-yr	1761	967.12	3.26	965.52	3.89	-1.60		0.63	
558+50	2-yr	2047	967.75	3.20	966.09	4.14	-1.66		0.94	
558+50	5-yr	3336	969.51	3.17	968.38	4.29	-1.13		1.12	
558+50	10-yr	4375	970.46	3.28	969.52	4.33	-0.94		1.05	
558+50	50-yr	7239	973.58	2.51	972.97	3.32	-0.61		0.81	
558+50	100-yr	8721	974.57	2.53	974.15	3.24	-0.42		0.71	
559+00	Avg Annual	134	960.39	1.60	959.47	1.89	-0.92		0.29	
559+00	0.5-yr	1422	966.09	3.24	964.68	3.78	-1.41		0.54	
559+00	1-yr	1670	966.81	3.35	965.25	4.03	-1.56		0.68	
559+00	1.5-yr	1761	967.04	3.36	965.44	4.12	-1.60		0.76	
559+00	2-yr	2047	967.67	3.34	966.01	4.37	-1.66		1.03	
559+00	5-yr	3336	969.45	3.39	968.30	4.52	-1.15		1.13	
559+00	10-yr	4375	970.42	3.34	969.45	4.51	-0.97		1.17	
559+00	50-yr	7239	973.57	2.60	972.97	3.26	-0.60		0.66	
559+00	100-yr	8721	974.57	2.63	974.15	3.19	-0.42		0.56	
559+50	Avg Annual	134	960.33	1.73	959.42	1.77	-0.91		0.04	
559+50	0.5-yr	1422	966.02	3.25	964.65	3.62	-1.37		0.37	
559+50	1-yr	1670	966.73	3.34	965.22	3.87	-1.51		0.53	
559+50	1.5-yr	1761	966.96	3.36	965.41	3.96	-1.55		0.60	
559+50	2-yr	2047	967.59	3.42	965.98	4.22	-1.61		0.80	
559+50	5-yr	3336	969.39	3.46	968.19	4.72	-1.20		1.26	
559+50	10-yr	4375	970.37	3.44	969.35	4.79	-1.02		1.35	
559+50	50-yr	7239	973.54	2.70	972.90	3.81	-0.64		1.11	
559+50	100-yr	8721	974.54	2.68	974.10	3.71	-0.44		1.03	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
560+00	Avg Annual	134	960.31	1.26	959.41	1.25	-0.90		-0.01	
560+00	0.5-yr	1422	965.94	3.28	964.63	3.43	-1.31		0.15	
560+00	1-yr	1670	966.63	3.46	965.19	3.69	-1.44		0.23	
560+00	1.5-yr	1761	966.86	3.52	965.38	3.78	-1.48		0.26	
560+00	2-yr	2047	967.47	3.71	965.95	4.04	-1.52		0.33	
560+00	5-yr	3336	969.28	3.88	968.15	4.06	-1.13		0.18	
560+00	10-yr	4375	970.29	3.79	969.38	3.49	-0.91		-0.30	
560+00	50-yr	7239	973.52	2.87	972.93	2.36	-0.59		-0.51	
560+00	100-yr	8721	974.52	2.85	974.12	2.27	-0.40		-0.58	
560+50	Avg Annual	134	960.28	1.41	959.40	1.04	-0.88		-0.37	
560+50	0.5-yr	1422	965.90	3.22	964.62	3.14	-1.28		-0.08	
560+50	1-yr	1670	966.60	3.27	965.18	3.35	-1.42		0.08	
560+50	1.5-yr	1761	966.83	3.22	965.38	3.42	-1.45		0.20	
560+50	2-yr	2047	967.49	2.87	965.94	3.64	-1.55		0.77	
560+50	5-yr	3336	969.32	1.77	968.17	3.06	-1.15		1.29	
560+50	10-yr	4375	970.31	1.56	969.37	2.25	-0.94		0.69	
560+50	50-yr	7239	973.51	1.13	972.90	1.36	-0.61		0.23	
560+50	100-yr	8721	974.50	1.09	974.09	1.25	-0.41		0.16	
560+70	Avg Annual	134	960.27	1.30	959.39	1.17	-0.88		-0.13	
560+70	0.5-yr	1422	965.89	3.23	964.59	3.27	-1.30		0.04	
560+70	1-yr	1670	966.58	3.35	965.15	3.50	-1.43		0.15	
560+70	1.5-yr	1761	966.81	3.36	965.34	3.59	-1.47		0.23	
560+70	2-yr	2047	967.44	3.31	965.91	3.84	-1.53		0.53	
560+70	5-yr	3336	969.29	3.26	968.07	4.11	-1.22		0.85	
560+70	10-yr	4375	970.28	3.42	969.30	4.01	-0.98		0.59	
560+70	50-yr	7239	973.51	2.60	972.90	2.84	-0.61		0.24	
560+70	100-yr	8721	974.51	2.63	974.10	2.74	-0.41		0.11	
Pomeroy		Pomeroy Avenue Bridge								
561+37	Avg Annual	134	960.20	1.79	959.32	1.85	-0.88		0.06	
561+37	0.5-yr	1422	965.80	3.54	964.52	3.55	-1.28		0.01	
561+37	1-yr	1670	966.48	3.69	965.07	3.80	-1.41		0.11	
561+37	1.5-yr	1761	966.70	3.75	965.26	3.88	-1.44		0.13	
561+37	2-yr	2047	967.29	3.96	965.82	4.14	-1.47		0.18	
561+37	5-yr	3336	969.02	4.27	967.82	5.07	-1.20		0.80	
561+37	10-yr	4375	969.93	4.39	968.97	5.13	-0.96		0.74	
561+37	50-yr	7239	972.78	3.53	972.33	3.18	-0.45		-0.35	
561+37	100-yr	8721	973.92	3.35	973.53	2.95	-0.39		-0.40	
561+50	Avg Annual	134	960.17	2.02	959.33	1.34	-0.84		-0.68	
561+50	0.5-yr	1422	965.70	4.17	964.52	3.42	-1.18		-0.75	
561+50	1-yr	1670	966.38	4.30	965.07	3.67	-1.31		-0.63	
561+50	1.5-yr	1761	966.60	4.35	965.26	3.76	-1.34		-0.59	
561+50	2-yr	2047	967.19	4.55	965.82	4.02	-1.37		-0.53	
561+50	5-yr	3336	968.83	5.25	967.81	5.00	-1.02		-0.25	
561+50	10-yr	4375	969.89	4.55	968.83	5.60	-1.06		1.05	
561+50	50-yr	7239	972.78	3.09	972.30	3.43	-0.48		0.34	
561+50	100-yr	8721	973.92	2.87	973.51	3.13	-0.41		0.26	
562+00	Avg Annual	134	960.13	1.62	959.31	1.31	-0.82		-0.31	
562+00	0.5-yr	1422	965.64	3.88	964.47	3.47	-1.17		-0.41	
562+00	1-yr	1670	966.31	4.05	965.02	3.73	-1.29		-0.32	
562+00	1.5-yr	1761	966.53	4.11	965.21	3.82	-1.32		-0.29	
562+00	2-yr	2047	967.11	4.32	965.76	4.09	-1.35		-0.23	
562+00	5-yr	3336	968.66	5.33	967.74	5.06	-0.92		-0.27	
562+00	10-yr	4375	969.60	5.49	968.72	5.68	-0.88		0.19	
562+00	50-yr	7239	972.62	4.46	972.24	3.37	-0.38		-1.09	
562+00	100-yr	8721	973.80	4.24	973.47	3.09	-0.33		-1.15	
562+50	Avg Annual	134	960.11	1.42	959.30	1.02	-0.81		-0.40	
562+50	0.5-yr	1422	965.61	3.58	964.45	3.33	-1.16		-0.25	
562+50	1-yr	1670	966.28	3.77	965.00	3.60	-1.28		-0.17	
562+50	1.5-yr	1761	966.50	3.83	965.19	3.69	-1.31		-0.14	
562+50	2-yr	2047	967.09	3.99	965.73	3.98	-1.36		-0.01	
562+50	5-yr	3336	968.71	4.43	967.72	4.79	-0.99		0.36	
562+50	10-yr	4375	969.64	4.53	968.78	4.71	-0.86		0.18	
562+50	50-yr	7239	972.62	3.87	972.22	3.08	-0.40		-0.79	
562+50	100-yr	8721	973.79	3.77	973.45	2.96	-0.34		-0.81	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
563+00	Avg Annual	134	960.09	1.33	959.29	1.10	-0.80		-0.23	
563+00	0.5-yr	1422	965.59	3.41	964.39	3.56	-1.20	0.15		
563+00	1-yr	1670	966.25	3.61	964.93	3.84	-1.32	0.23		
563+00	1.5-yr	1761	966.48	3.58	965.12	3.93	-1.36	0.35		
563+00	2-yr	2047	967.10	3.55	965.68	4.13	-1.42	0.58		
563+00	5-yr	3336	968.74	3.73	967.77	4.04	-0.97	0.31		
563+00	10-yr	4375	969.66	3.87	968.82	3.86	-0.84	-0.01		
563+00	50-yr	7239	972.62	3.55	972.21	2.76	-0.41	-0.79		
563+00	100-yr	8721	973.79	3.58	973.44	2.66	-0.35	-0.92		
563+50	Avg Annual	134	960.05	1.47	959.27	1.23	-0.78		-0.24	
563+50	0.5-yr	1422	965.45	4.08	964.32	3.84	-1.13	-0.24		
563+50	1-yr	1670	966.08	4.37	964.85	4.15	-1.23	-0.22		
563+50	1.5-yr	1761	966.29	4.46	965.03	4.25	-1.26	-0.21		
563+50	2-yr	2047	966.91	4.49	965.58	4.47	-1.33	-0.02		
563+50	5-yr	3336	968.62	4.48	967.72	4.23	-0.90	-0.25		
563+50	10-yr	4375	969.56	4.58	968.80	3.87	-0.76	-0.71		
563+50	50-yr	7239	972.56	4.07	972.21	2.62	-0.35	-1.45		
563+50	100-yr	8721	973.74	4.08	973.44	2.51	-0.30	-1.57		
564+00	Avg Annual	134	960.04	1.32	959.25	1.37	-0.79		0.05	
564+00	0.5-yr	1422	965.45	3.48	964.26	3.90	-1.19	0.42		
564+00	1-yr	1670	966.12	3.34	964.79	4.20	-1.33	0.86		
564+00	1.5-yr	1761	966.35	3.27	964.97	4.30	-1.38	1.03		
564+00	2-yr	2047	966.98	3.01	965.52	4.52	-1.46	1.51		
564+00	5-yr	3336	968.67	2.86	967.69	4.18	-0.98	1.32		
564+00	10-yr	4375	969.60	2.97	968.77	3.88	-0.83	0.91		
564+00	50-yr	7239	972.58	2.77	972.19	2.81	-0.39	0.04		
564+00	100-yr	8721	973.75	2.85	973.42	2.74	-0.33	-0.11		
564+50	Avg Annual	134	960.02	1.54	959.22	1.48	-0.80		-0.06	
564+50	0.5-yr	1422	965.41	3.28	964.22	3.87	-1.19	0.59		
564+50	1-yr	1670	966.08	3.24	964.75	4.14	-1.33	0.90		
564+50	1.5-yr	1761	966.30	3.20	964.93	4.22	-1.37	1.02		
564+50	2-yr	2047	966.94	2.95	965.49	4.36	-1.45	1.41		
564+50	5-yr	3336	968.64	2.79	967.69	3.87	-0.95	1.08		
564+50	10-yr	4375	969.57	2.87	968.76	3.61	-0.81	0.74		
564+50	50-yr	7239	972.56	2.68	972.18	2.62	-0.38	-0.06		
564+50	100-yr	8721	973.73	2.73	973.42	2.58	-0.31	-0.15		
565+00	Avg Annual	134	959.95	1.71	959.21	1.31	-0.74		-0.40	
565+00	0.5-yr	1422	965.38	3.15	964.20	3.54	-1.18	0.39		
565+00	1-yr	1670	966.04	3.13	964.73	3.81	-1.31	0.68		
565+00	1.5-yr	1761	966.26	3.12	964.91	3.90	-1.35	0.78		
565+00	2-yr	2047	966.88	3.06	965.46	4.12	-1.42	1.06		
565+00	5-yr	3336	968.59	2.95	967.66	3.65	-0.93	0.70		
565+00	10-yr	4375	969.52	3.00	968.75	3.39	-0.77	0.39		
565+00	50-yr	7239	972.54	2.69	972.18	2.54	-0.36	-0.15		
565+00	100-yr	8721	973.71	2.72	973.41	2.51	-0.30	-0.21		
565+50	Avg Annual	134	959.91	1.47	959.19	1.30	-0.72		-0.17	
565+50	0.5-yr	1422	965.31	3.30	964.17	3.48	-1.14	0.18		
565+50	1-yr	1670	965.96	3.38	964.69	3.74	-1.27	0.36		
565+50	1.5-yr	1761	966.18	3.40	964.87	3.83	-1.31	0.43		
565+50	2-yr	2047	966.80	3.37	965.41	4.07	-1.39	0.70		
565+50	5-yr	3336	968.53	3.28	967.64	3.48	-0.89	0.20		
565+50	10-yr	4375	969.47	3.29	968.73	3.23	-0.74	-0.06		
565+50	50-yr	7239	972.51	2.89	972.17	2.43	-0.34	-0.46		
565+50	100-yr	8721	973.68	2.94	973.40	2.39	-0.28	-0.55		
566+00	Avg Annual	134	959.87	1.51	959.18	1.12	-0.69		-0.39	
566+00	0.5-yr	1422	965.26	3.34	964.14	3.38	-1.12	0.04		
566+00	1-yr	1670	965.90	3.44	964.66	3.66	-1.24	0.22		
566+00	1.5-yr	1761	966.11	3.47	964.84	3.75	-1.27	0.28		
566+00	2-yr	2047	966.73	3.49	965.38	3.99	-1.35	0.50		
566+00	5-yr	3336	968.47	3.38	967.60	3.51	-0.87	0.13		
566+00	10-yr	4375	969.43	3.34	968.69	3.31	-0.74	-0.03		
566+00	50-yr	7239	972.48	2.87	972.15	2.61	-0.33	-0.26		
566+00	100-yr	8721	973.66	2.88	973.38	2.61	-0.28	-0.27		

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
566+50	Avg Annual	134	959.84	1.34	959.16	1.24	-0.68		-0.10	
566+50	0.5-yr	1422	965.20	3.32	964.10	3.45	-1.10		0.13	
566+50	1-yr	1670	965.83	3.53	964.61	3.72	-1.22		0.19	
566+50	1.5-yr	1761	966.03	3.60	964.79	3.81	-1.24		0.21	
566+50	2-yr	2047	966.63	3.71	965.33	4.08	-1.30		0.37	
566+50	5-yr	3336	968.40	3.57	967.46	4.27	-0.94		0.70	
566+50	10-yr	4375	969.36	3.55	968.58	4.11	-0.78		0.56	
566+50	50-yr	7239	972.44	3.01	972.10	3.28	-0.34		0.27	
566+50	100-yr	8721	973.62	3.00	973.34	3.28	-0.28		0.28	
567+00	Avg Annual	134	959.81	1.29	959.15	1.09	-0.66		-0.20	
567+00	0.5-yr	1422	965.08	3.65	964.07	3.40	-1.01		-0.25	
567+00	1-yr	1670	965.70	3.81	964.58	3.67	-1.12		-0.14	
567+00	1.5-yr	1761	965.90	3.86	964.75	3.77	-1.15		-0.09	
567+00	2-yr	2047	966.50	3.96	965.28	4.03	-1.22		0.07	
567+00	5-yr	3336	968.33	3.66	967.42	4.17	-0.91		0.51	
567+00	10-yr	4375	969.30	3.52	968.54	3.92	-0.76		0.40	
567+00	50-yr	7239	972.42	2.86	972.07	2.83	-0.35		-0.03	
567+00	100-yr	8721	973.60	2.83	973.31	2.77	-0.29		-0.06	
567+50	Avg Annual	134	959.78	1.38	959.13	1.24	-0.65		-0.14	
567+50	0.5-yr	1422	964.97	3.60	964.01	3.52	-0.96		-0.08	
567+50	1-yr	1670	965.56	3.79	964.52	3.76	-1.04		-0.03	
567+50	1.5-yr	1761	965.76	3.86	964.70	3.84	-1.06		-0.02	
567+50	2-yr	2047	966.33	4.04	965.23	4.07	-1.10		0.03	
567+50	5-yr	3336	968.18	3.43	967.29	4.63	-0.89		1.20	
567+50	10-yr	4375	969.06	2.89	968.39	4.81	-0.67		1.92	
567+50	50-yr	7239	972.14	1.76	972.03	3.83	-0.11		2.07	
567+50	100-yr	8721	973.31	1.66	973.28	3.82	-0.03		2.16	
568+00	Avg Annual	134	959.77	1.04	959.11	1.18	-0.66		0.14	
568+00	0.5-yr	1422	964.84	3.77	963.94	3.73	-0.90		-0.04	
568+00	1-yr	1670	965.41	4.05	964.43	4.04	-0.98		-0.01	
568+00	1.5-yr	1761	965.59	4.15	964.61	4.14	-0.98		-0.01	
568+00	2-yr	2047	966.14	4.41	965.11	4.45	-1.03		0.04	
568+00	5-yr	3336	967.93	4.94	967.12	5.34	-0.81		0.40	
568+00	10-yr	4375	968.91	4.43	968.15	5.83	-0.76		1.40	
568+00	50-yr	7239	971.94	2.58	971.81	3.35	-0.13		0.77	
568+00	100-yr	8721	973.11	2.39	973.03	3.14	-0.08		0.75	
568+50	Avg Annual	134	959.75	1.23	959.11	1.01	-0.64		-0.22	
568+50	0.5-yr	1422	964.77	3.69	963.92	3.49	-0.85		-0.20	
568+50	1-yr	1670	965.33	3.97	964.41	3.79	-0.92		-0.18	
568+50	1.5-yr	1761	965.51	4.06	964.58	3.89	-0.93		-0.17	
568+50	2-yr	2047	966.04	4.35	965.09	4.18	-0.95		-0.17	
568+50	5-yr	3336	967.77	5.15	967.10	4.99	-0.67		-0.16	
568+50	10-yr	4375	968.73	5.70	968.10	5.61	-0.63		-0.09	
568+50	50-yr	7239	972.03	5.38	971.76	5.41	-0.27		0.03	
568+50	100-yr	8721	973.22	5.47	973.01	5.58	-0.21		0.11	
569+00	Avg Annual	134	959.70	1.63	959.11	0.85	-0.59		-0.78	
569+00	0.5-yr	1422	964.66	4.02	963.91	3.11	-0.75		-0.91	
569+00	1-yr	1670	965.21	4.28	964.41	3.41	-0.80		-0.87	
569+00	1.5-yr	1761	965.39	4.36	964.58	3.51	-0.81		-0.85	
569+00	2-yr	2047	965.93	4.56	965.08	3.82	-0.85		-0.74	
569+00	5-yr	3336	967.69	5.05	967.09	4.49	-0.60		-0.56	
569+00	10-yr	4375	968.65	5.47	968.10	4.95	-0.55		-0.52	
569+00	50-yr	7239	971.98	5.07	971.78	4.70	-0.20		-0.37	
569+00	100-yr	8721	973.18	5.19	973.02	4.87	-0.16		-0.32	
569+50	Avg Annual	134	959.62	2.03	959.08	1.32	-0.54		-0.71	
569+50	0.5-yr	1422	964.49	4.41	963.78	3.92	-0.71		-0.49	
569+50	1-yr	1670	965.03	4.60	964.26	4.23	-0.77		-0.37	
569+50	1.5-yr	1761	965.22	4.63	964.42	4.34	-0.80		-0.29	
569+50	2-yr	2047	965.79	4.66	964.92	4.63	-0.87		-0.03	
569+50	5-yr	3336	967.58	4.85	966.92	5.16	-0.66		0.31	
569+50	10-yr	4375	968.55	5.26	967.96	5.51	-0.59		0.25	
569+50	50-yr	7239	971.94	4.57	971.72	4.96	-0.22		0.39	
569+50	100-yr	8721	973.15	4.65	972.97	5.08	-0.18		0.43	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
570+00	Avg Annual	134	959.62	1.10	959.06	1.27	-0.56		0.17	
570+00	0.5-yr	1422	964.48	3.45	963.75	3.75	-0.73		0.30	
570+00	1-yr	1670	965.01	3.72	964.22	4.06	-0.79		0.34	
570+00	1.5-yr	1761	965.19	3.82	964.39	4.17	-0.80		0.35	
570+00	2-yr	2047	965.72	4.08	964.88	4.48	-0.84		0.40	
570+00	5-yr	3336	967.45	4.83	966.80	5.32	-0.65		0.49	
570+00	10-yr	4375	968.40	5.30	967.80	5.83	-0.60		0.53	
570+00	50-yr	7239	971.79	5.16	971.58	5.49	-0.21		0.33	
570+00	100-yr	8721	973.00	5.29	972.84	5.65	-0.16		0.36	
570+50	Avg Annual	134	959.58	1.49	959.03	1.37	-0.55		-0.12	
570+50	0.5-yr	1422	964.35	3.92	963.70	3.74	-0.65		-0.18	
570+50	1-yr	1670	964.89	4.15	964.17	4.04	-0.72		-0.11	
570+50	1.5-yr	1761	965.07	4.22	964.34	4.15	-0.73		-0.07	
570+50	2-yr	2047	965.62	4.36	964.83	4.43	-0.79		0.07	
570+50	5-yr	3336	967.43	4.48	966.82	4.76	-0.61		0.28	
570+50	10-yr	4375	968.40	4.65	967.85	4.97	-0.55		0.32	
570+50	50-yr	7239	971.85	3.86	971.67	4.23	-0.18		0.37	
570+50	100-yr	8721	973.07	3.78	972.93	4.26	-0.14		0.48	
571+00	Avg Annual	134	959.57	1.13	959.03	0.89	-0.54		-0.24	
571+00	0.5-yr	1422	964.32	3.51	963.71	3.18	-0.61		-0.33	
571+00	1-yr	1670	964.85	3.72	964.18	3.45	-0.67		-0.27	
571+00	1.5-yr	1761	965.03	3.79	964.35	3.53	-0.68		-0.26	
571+00	2-yr	2047	965.58	3.96	964.84	3.77	-0.74		-0.19	
571+00	5-yr	3336	967.36	4.34	966.80	4.36	-0.56		0.02	
571+00	10-yr	4375	968.34	4.47	967.83	4.66	-0.51		0.19	
571+00	50-yr	7239	971.80	3.83	971.65	4.07	-0.15		0.24	
571+00	100-yr	8721	973.02	3.90	972.91	4.17	-0.11		0.27	
571+50	Avg Annual	134	959.54	1.31	959.01	1.18	-0.53		-0.13	
571+50	0.5-yr	1422	964.23	3.67	963.62	3.58	-0.61		-0.09	
571+50	1-yr	1670	964.75	3.97	964.09	3.89	-0.66		-0.08	
571+50	1.5-yr	1761	964.92	4.07	964.25	3.99	-0.67		-0.08	
571+50	2-yr	2047	965.44	4.36	964.72	4.30	-0.72		-0.06	
571+50	5-yr	3336	967.08	5.34	966.59	5.25	-0.49		-0.09	
571+50	10-yr	4375	967.99	5.82	967.54	5.85	-0.45		0.03	
571+50	50-yr	7239	971.61	4.99	971.54	4.64	-0.07		-0.35	
571+50	100-yr	8721	972.86	4.94	972.82	4.60	-0.04		-0.34	
572+00	Avg Annual	134	959.51	1.14	958.98	1.45	-0.53		0.31	
572+00	0.5-yr	1422	964.17	3.55	963.56	3.71	-0.61		0.16	
572+00	1-yr	1670	964.68	3.79	964.02	4.01	-0.66		0.22	
572+00	1.5-yr	1761	964.85	3.88	964.18	4.11	-0.67		0.23	
572+00	2-yr	2047	965.37	4.10	964.66	4.39	-0.71		0.29	
572+00	5-yr	3336	967.01	4.84	966.56	4.96	-0.45		0.12	
572+00	10-yr	4375	967.96	5.03	967.55	5.16	-0.41		0.13	
572+00	50-yr	7239	971.67	3.60	971.56	3.81	-0.11		0.21	
572+00	100-yr	8721	972.95	3.08	972.88	3.40	-0.07		0.32	
572+50	Avg Annual	134	959.45	1.63	958.94	1.54	-0.51		-0.09	
572+50	0.5-yr	1422	963.98	4.09	963.51	3.77	-0.47		-0.32	
572+50	1-yr	1670	964.48	4.34	963.96	4.07	-0.52		-0.27	
572+50	1.5-yr	1761	964.64	4.43	964.12	4.18	-0.52		-0.25	
572+50	2-yr	2047	965.12	4.72	964.59	4.48	-0.53		-0.24	
572+50	5-yr	3336	966.65	5.75	966.38	5.39	-0.27		-0.36	
572+50	10-yr	4375	967.54	6.22	967.35	5.71	-0.19		-0.51	
572+50	50-yr	7239	971.54	4.33	971.49	4.14	-0.05		-0.19	
572+50	100-yr	8721	972.87	3.63	972.84	3.62	-0.03		-0.01	
573+00	Avg Annual	134	959.37	1.82	958.92	1.28	-0.45		-0.54	
573+00	0.5-yr	1422	963.79	4.37	963.47	3.63	-0.32		-0.74	
573+00	1-yr	1670	964.27	4.67	963.92	3.94	-0.35		-0.73	
573+00	1.5-yr	1761	964.43	4.76	964.08	4.04	-0.35		-0.72	
573+00	2-yr	2047	964.89	5.03	964.54	4.34	-0.35		-0.69	
573+00	5-yr	3336	966.43	5.88	966.30	4.96	-0.13		-0.92	
573+00	10-yr	4375	967.39	6.05	967.29	5.15	-0.10		-0.90	
573+00	50-yr	7239	971.53	3.85	971.50	3.63	-0.03		-0.22	
573+00	100-yr	8721	972.86	3.27	972.84	3.21	-0.02		-0.06	

TABLE 1
**SUMMARY OF HEC-RAS MODEL PREDICTIONS FOR CHANGES IN WATER SURFACE
ELEVATIONS AND VELOCITIES FROM LYMAN STREET TO THE CONFLUENCE**
1.5 MILE REACH REMOVAL ACTION

Stationing		Storm	Pre-Construction		As-Built		Change (As-Built - Existing)			
Construction Station	Profile	Q (cfs)	El. (ft.)	V (fps)	El. (ft)	V (fps)	D El	MAX??	D V (fps)	MAX??
573+50	Avg Annual	134	959.21	2.50	958.90	1.21	-0.31		-1.29	
573+50	0.5-yr	1422	963.65	4.34	963.43	3.59	-0.22		-0.75	
573+50	1-yr	1670	964.11	4.64	963.87	3.89	-0.24		-0.75	
573+50	1.5-yr	1761	964.26	4.74	964.03	4.00	-0.23		-0.74	
573+50	2-yr	2047	964.73	4.92	964.49	4.29	-0.24		-0.63	
573+50	5-yr	3336	966.36	5.16	966.22	4.55	-0.14		-0.61	
573+50	10-yr	4375	967.33	5.21	967.25	4.53	-0.08		-0.68	
573+50	50-yr	7239	971.51	3.45	971.50	3.10	-0.01		-0.35	
573+50	100-yr	8721	972.84	3.07	972.84	2.81	0.00		-0.26	
574+00	Avg Annual	134	959.18	1.12	958.91	0.67	-0.27		-0.45	
574+00	0.5-yr	1422	963.62	3.36	963.45	2.78	-0.17		-0.58	
574+00	1-yr	1670	964.06	3.67	963.91	3.05	-0.15		-0.62	
574+00	1.5-yr	1761	964.21	3.78	964.06	3.15	-0.15		-0.63	
574+00	2-yr	2047	964.68	3.98	964.53	3.41	-0.15		-0.57	
574+00	5-yr	3336	966.33	4.06	966.21	3.96	-0.12		-0.10	
574+00	10-yr	4375	967.32	4.05	967.21	4.24	-0.11		0.19	
574+00	50-yr	7239	971.51	2.68	971.47	3.31	-0.04		0.63	
574+00	100-yr	8721	972.84	2.40	972.81	3.12	-0.03		0.72	
574+50	Avg Annual	134	959.16	0.79	958.90	0.64	-0.26		-0.15	
574+50	0.5-yr	1422	963.56	2.87	963.44	2.67	-0.12		-0.20	
574+50	1-yr	1670	964.01	3.01	963.90	2.88	-0.11		-0.13	
574+50	1.5-yr	1761	964.17	3.06	964.06	2.95	-0.11		-0.11	
574+50	2-yr	2047	964.64	3.16	964.53	3.15	-0.11		-0.01	
574+50	5-yr	3336	966.31	3.14	966.23	3.35	-0.08		0.21	
574+50	10-yr	4375	967.31	3.13	967.24	3.47	-0.07		0.34	
574+50	50-yr	7239	971.51	2.15	971.49	2.67	-0.02		0.52	
574+50	100-yr	8721	972.84	1.97	972.82	2.52	-0.02		0.55	
575+00	Avg Annual	134	959.14	0.95	958.90	0.71	-0.24		-0.24	
575+00	0.5-yr	1422	963.43	3.44	963.42	2.71	-0.01		-0.73	
575+00	1-yr	1670	963.89	3.52	963.88	2.88	-0.01		-0.64	
575+00	1.5-yr	1761	964.05	3.54	964.04	2.94	-0.01		-0.60	
575+00	2-yr	2047	964.52	3.64	964.51	3.12	-0.01		-0.52	
575+00	5-yr	3336	966.20	3.78	966.17	3.66	-0.03		-0.12	
575+00	10-yr	4375	967.23	3.66	967.18	3.85	-0.05		0.19	
575+00	50-yr	7239	971.49	2.36	971.46	3.00	-0.03		0.64	
575+00	100-yr	8721	972.82	2.15	972.80	2.85	-0.02		0.70	

Notes:

El = Water Surface Elevation

V = Velocity

On Pg. 7 the shaded areas represent increases in water surface elevations in post-remediation conditions.

TABLE 2
SUMMARY OF MAXIMUM WATER SURFACE ELEVATIONS AND VELOCITY INCREASES FROM LYMAN STREET TO THE CONFLUENCE
1.5 MILE REACH REMOVAL ACTION

Flow	Parameter	Overall		Lyman To Elm		Elm to Dawes		Dawes to Pomeroy		Pomeroy to Confluence	
		Maximum	Station	Maximum	Station	Maximum	Station	Maximum	Station	Maximum	Station
Avg Annual	EI	0.20	522+79	-1.05	521+53	0.20	522+79	-0.65	544+50	-0.24	575+00
	V	3.44	524+50	1.21	500+00	3.44	524+50	2.00	546+50	0.31	572+00
0.5 year storm	EI	-0.01	575+00	-0.66	521+53	-0.40	523+10	-1.28	560+50	-0.01	575+00
	V	7.15	524+00	1.04	506+50	7.15	524+00	1.09	551+00	0.59	564+50
1 year storm	EI	-0.01	575+00	-0.75	500+50	-0.56	523+10	-1.42	560+50	-0.01	575+00
	V	7.44	524+00	1.10	520+50	7.44	524+00	1.25	551+00	0.90	564+50
1.5 year storm	EI	-0.01	575+00	-0.73	500+50	-0.61	523+10	-1.45	560+50	-0.01	575+00
	V	7.54	524+00	1.14	520+50	7.54	524+00	1.31	551+00	1.03	564+00
2 year storm	EI	-0.01	575+00	-0.70	500+50	-0.80	523+10	-1.52	560+00	-0.01	575+00
	V	7.78	524+00	1.26	520+50	7.78	524+00	1.51	547+00	1.51	564+00
5 year storm	EI	-0.03	575+00	-0.55	500+50	-1.54	522+50	-0.96	556+50	-0.03	575+00
	V	3.60	527+50	1.56	520+50	3.60	527+50	1.68	547+00	1.32	564+00
10 year storm	EI	-0.05	575+00	-0.29	500+50	-0.68	542+88	-0.74	553+50	-0.05	575+00
	V	2.45	527+50	1.36	520+50	2.45	527+50	1.58	547+00	1.92	567+50
50 year storm	EI	-0.01	573+50	-0.79	500+50	-0.61	524+50	-0.52	554+00	-0.01	573+50
	V	2.07	567+50	0.98	500+00	1.36	542+60	1.61	546+00	2.07	567+50
100 year storm	EI	0.00	573+50	-1.03	500+50	-0.29	524+50	-0.38	554+00	0.00	573+50
	V	2.16	567+50	0.60	500+00	1.48	542+60	1.47	546+00	2.16	567+50
Max All	EI	0.20	522+79	-0.29	500+50	0.20	522+79	-0.38	554+00	0.00	573+50
	V	7.78	524+00	1.56	520+50	7.78	524+00	2.00	546+50	2.16	567+50

Notes:

EI = Water Surface Elevation

V = Velocity

TABLE 3
FLOOD STORAGE CAPACITY CHANGES BY REACH
1.5 MILE REACH REMOVAL ACTION

River Reach	FSC Changes Associated within the Limit of Work (Riverbanks and River Channel) ^x	FSC Changes Associated within the Limit of Work (Aquatic Enhancement Structures) ^t	FSC Changes (Outside the Limit of Work) [*]	Totals
Lyman to Elm	1700 [#]	-196	1,358	2,862
Elm to Dawes	2,120	-154	0	1,966
Dawes to Pomeroy	1,880	-54	0	1,826
Pomeroy to Confluence	3,916	-146	-2,000	1,770
Totals	9,616	-550	-642	8,424

Notes:

All volumes presented in the table above are in cubic yards. Positive numbers represent a gain in flood storage capacity while negative numbers denote a loss in flood storage capacity.

^xThe total flood storage gain in the Limit of Work (Riverbanks and River Channel) category was calculated by comparing the as-built topography against the existing topography. Existing topography was based on aerial photogrammetric mapping conducted in 2000, supplemented with an existing conditions topographic survey performed by Hill-Engineers, Architects, Planners, Inc. in January 2005 that preceded any impact for 1.5 Mile Removal Action.

^tThe total number of aquatic enhancement structures used for the volume calculation above were taken off Final Design Drawings. The structures included boulders (0.5 cy), rock spurs (3 cy), wing deflectors (24 cy), and rock weirs (17 cy).

* See Table 4: Flood Storage Capacity Changes Outside the Limit of Work for details per parcel where applicable changes were made.

[#] Of the total flood storage gain in the Limit of Work (Riverbanks and River Channel) category for the Lyman to Elm Reach, 190 cubic yards can be attributed to the underfilling that occurred on parcel I8-23-6. The area where this gain in flood storage capacity was realized was bounded by the upstream and downstream parcel boundary, the limit of work, and the centerline of the river.

TABLE 4
FLOOD STORAGE CAPACITY CHANGES OUTSIDE THE LIMIT OF WORK
1.5 MILE REACH REMOVAL ACTION

River Reach	Parcel and Location Description	Volume
Lyman to Elm	I9-4-201 - Massery ^{W*}	135
	I9-4-201 - Massery ^{GE*}	139
	I9-4-25/203 - Johnson Ford ^{W*}	63
	I9-4-25/203 - Johnson Ford ^{GE*}	50
	I9-4-14/19 - Quattrochi	0
	I8-24-5 - 55 Root Place *	85
	I8-24-1 - Harry's Supermarket *+	1,096
	I8-23-6 - Barbalunga Access Road*	-210
	I6-1-66 - McLean *	-13
Pomeroy to Confluence	I6-1-67 - Tierney *	-10
	I6-1-68 - Edwards *	41
	I7-1-101 - Fred Garner Park Soccer Field, Paving **	-2,018

Notes:

All volumes presented in the table above are in cubic yards. Positive numbers represent a gain in flood storage capacity while negative numbers denote a loss in flood storage capacity.

* Denotes Net Change in Flood Storage Capacity for restoration performed by EPA as part of the 1.5 Mile Reach Removal Action.

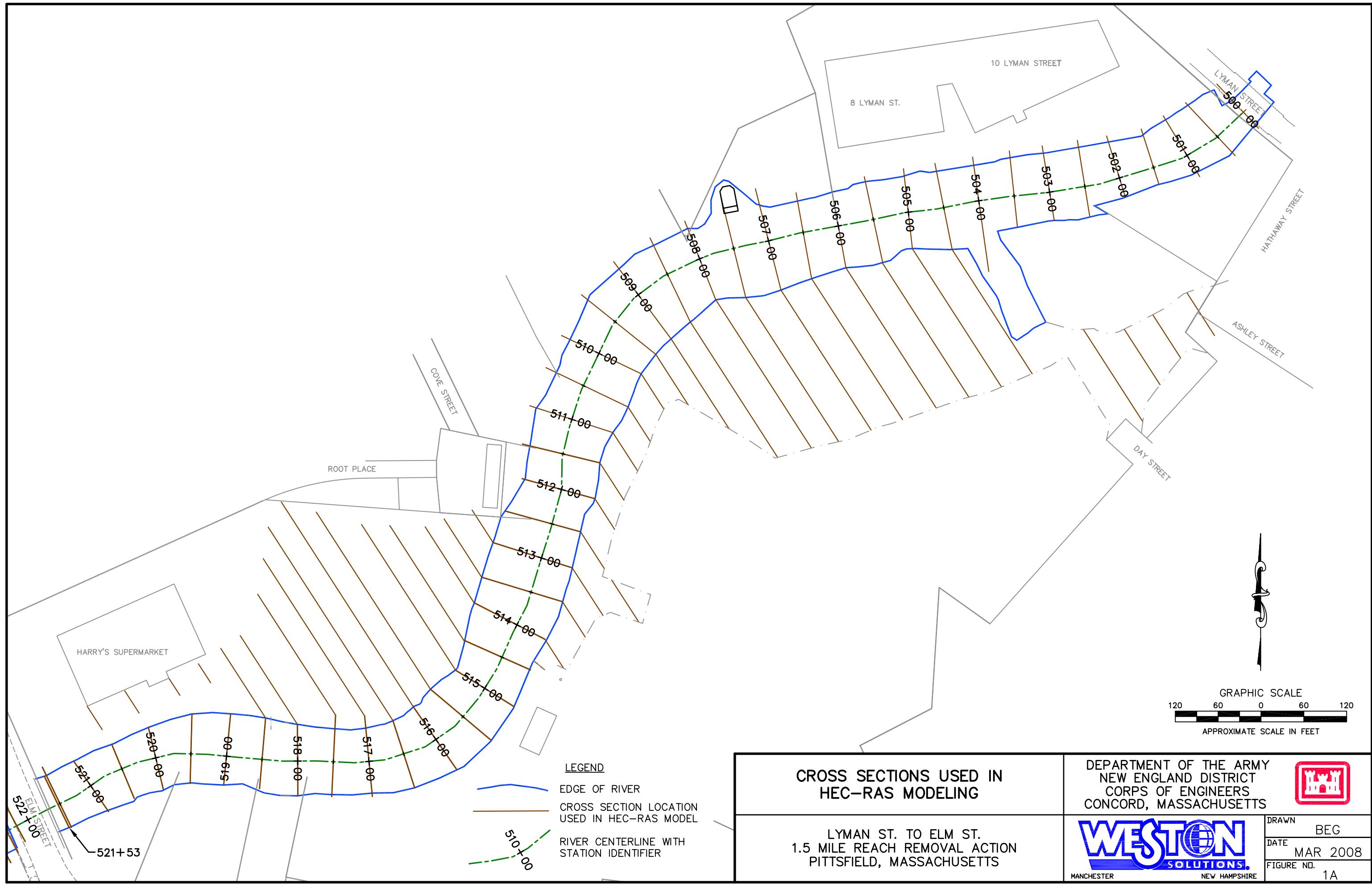
** Denotes Net Change in Flood Storage Capacity for areas Where EPA performed limited over-excavation as part of the access road construction and removal activities. GE subsequently performed remediation/restoration activities in those area to the revised grade established by EPA.

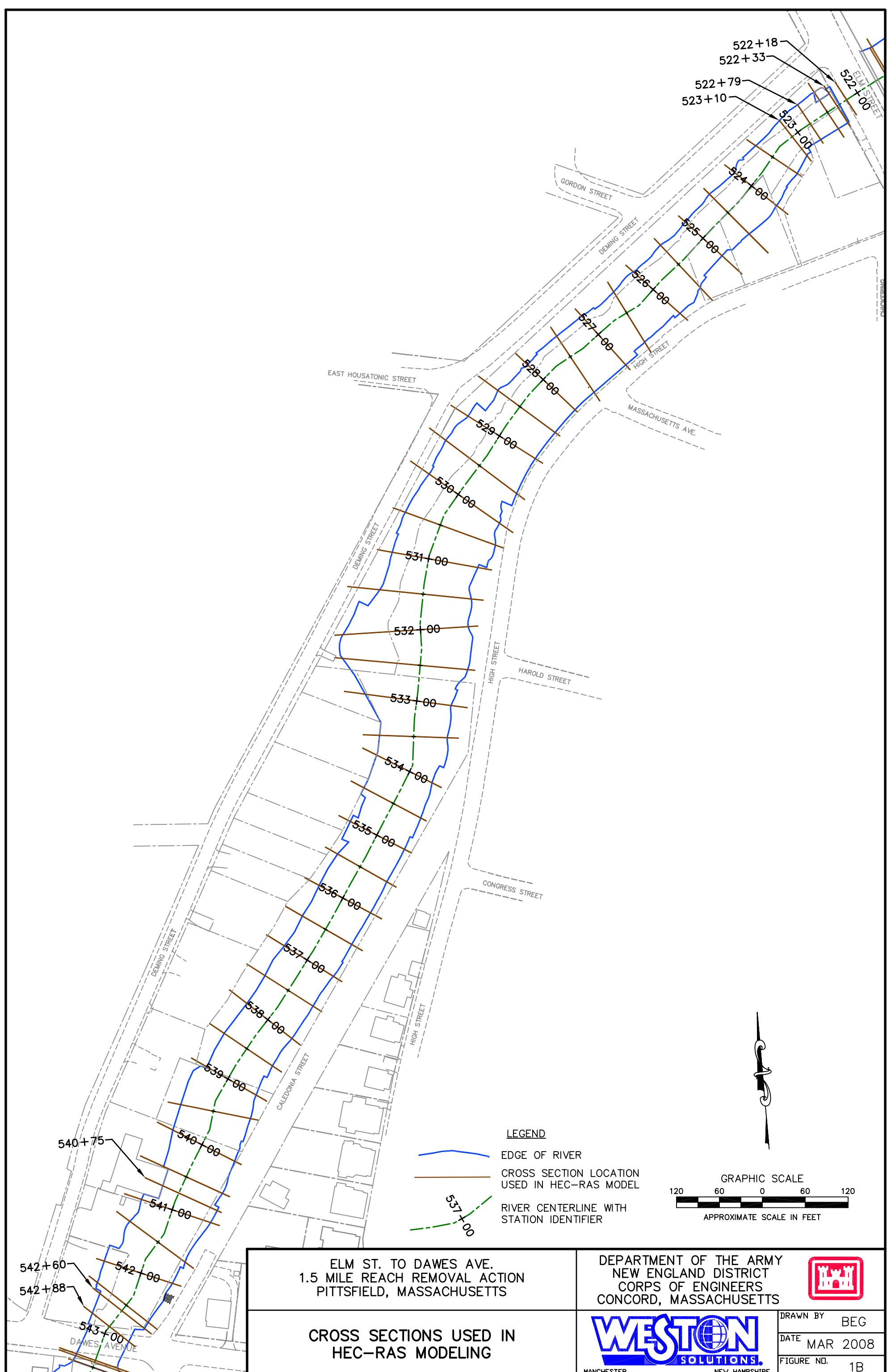
* Flood Storage Capacity changes are based on an As-built topographic survey performed by Hill-Engineers, Architects, Planners, Inc. in July-September of 2006. Existing topography was based on aerial photogrammetric mapping conducted in 2000, supplemented with an existing conditions topographic survey performed by Hill-Engineers, Architects, Planners, Inc. in January 2005 that preceded any impact for 1.5 Mile Removal Action.

** Flood Storage Capacity changes are based on an As-built topographic survey performed by Hill-Engineers, Architects, Planners, Inc. in September/October of 2006. Existing topography was based on a topographic survey performed by Hill-Engineers, Architects, Planners, Inc. in January 2005 that preceded any impact for 1.5 Mile Removal Action.

+ Original topographic survey does not encompass the entire restored area. Therefore net flood storage change reflects only areas where original topography and as-built topography overlap.

FIGURES





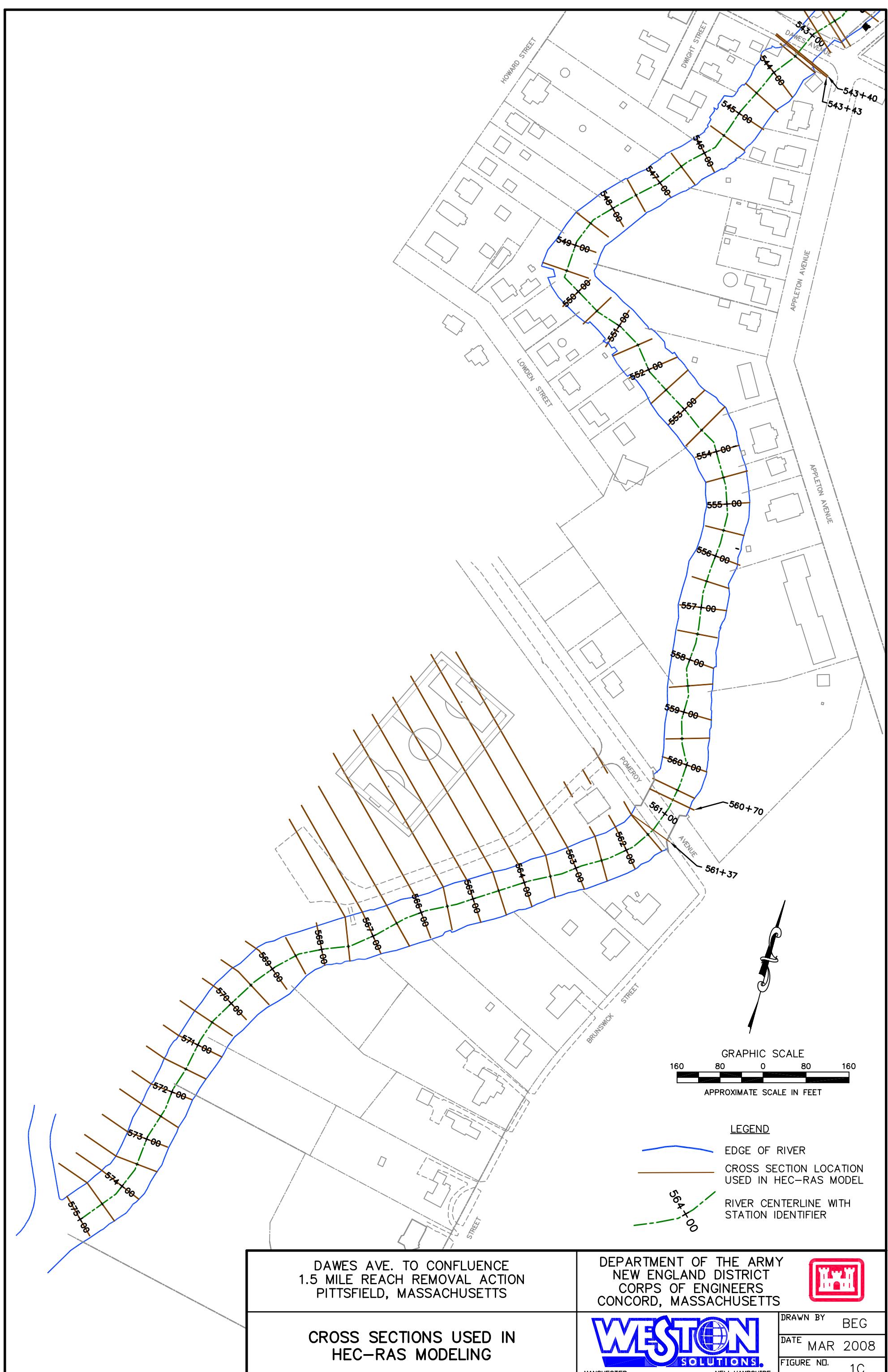


Figure 2A
Lyman Street to the Confluence
Average Annual Flow (134 CFS)
Pre-Remediation vs. Post-Remediation

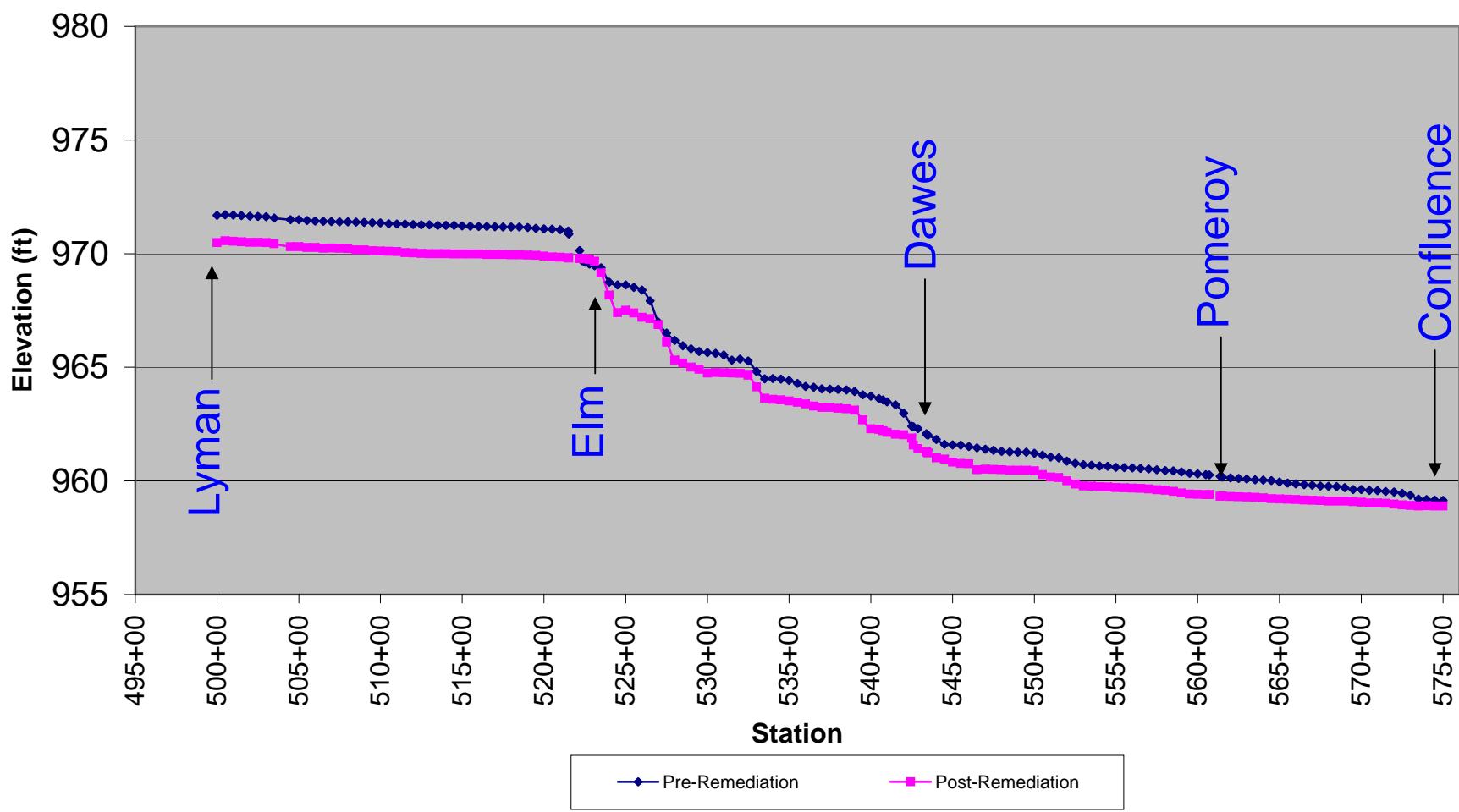


Figure 2B
Lyman Street to the Confluence
5-Yr Storm Event (3,336 CFS)
Pre-Remediation vs. Post-Remediation

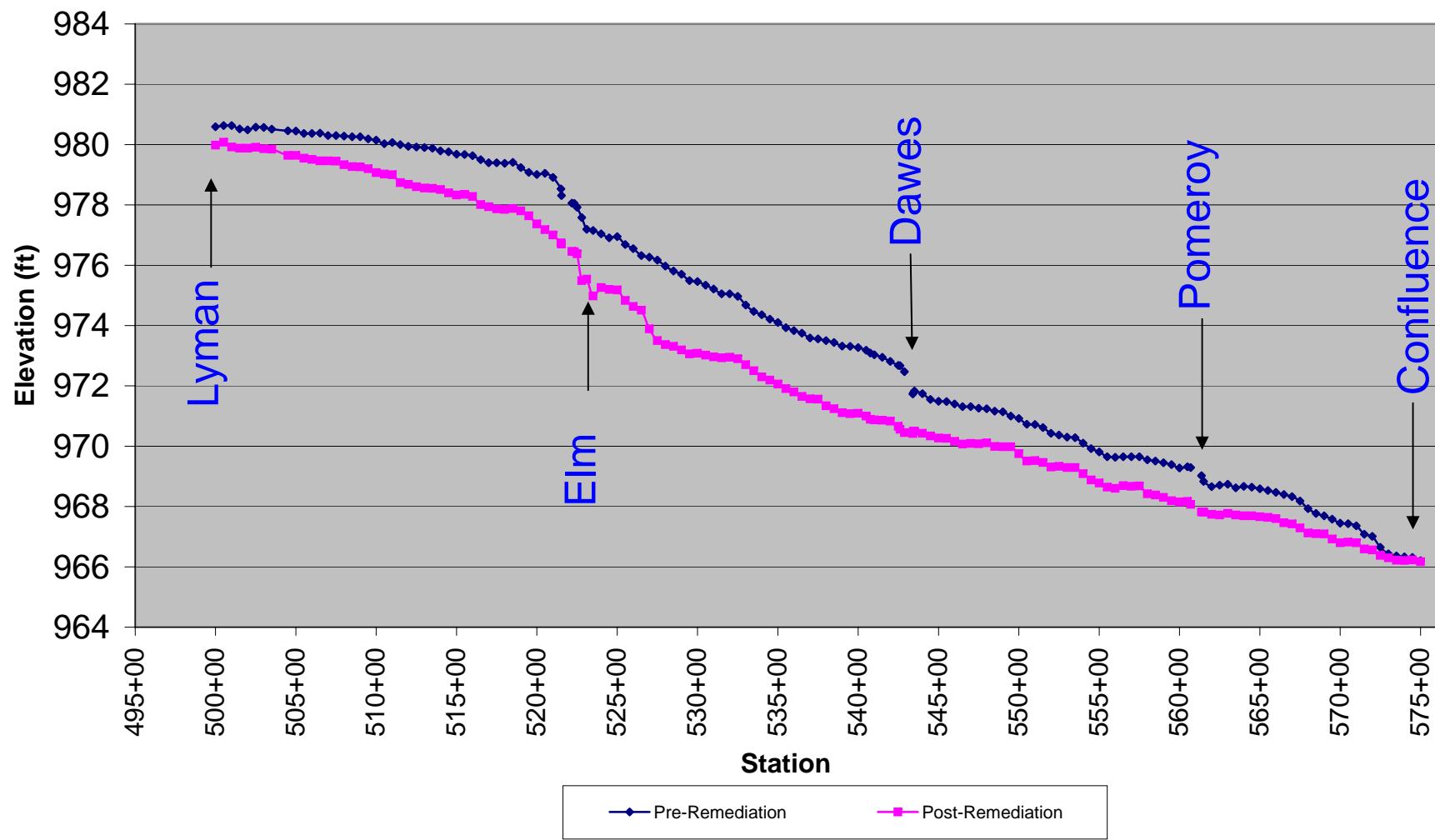


Figure 2C
Lyman Street to the Confluence
10-Yr Storm Event (4,375 CFS)
Pre-Remediation vs. Post-Remediation

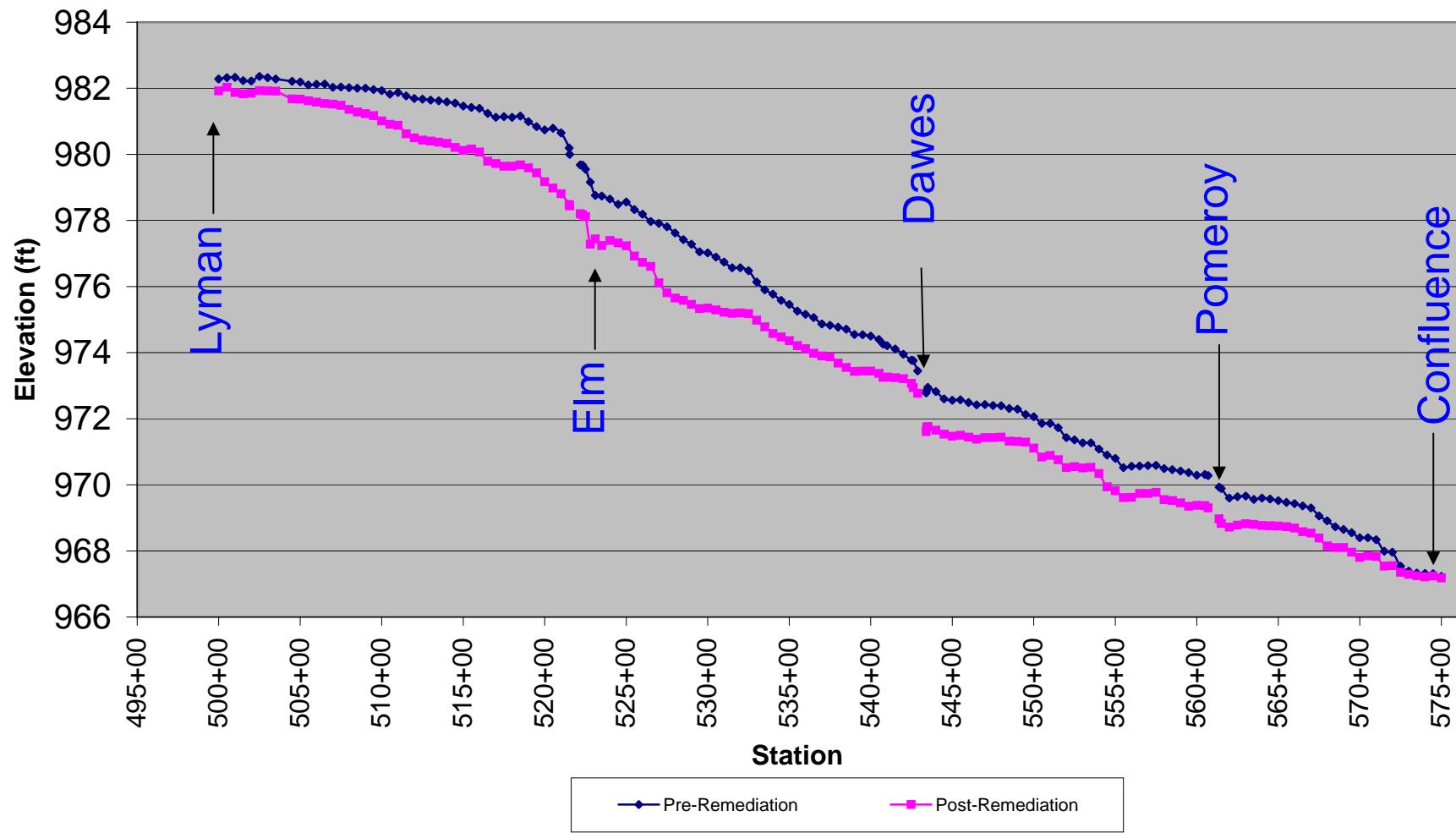


Figure 2D
Lyman Street to the Confluence
50-Yr Storm Event (7,239 CFS)
Pre-Remediation vs. Post-Remediation

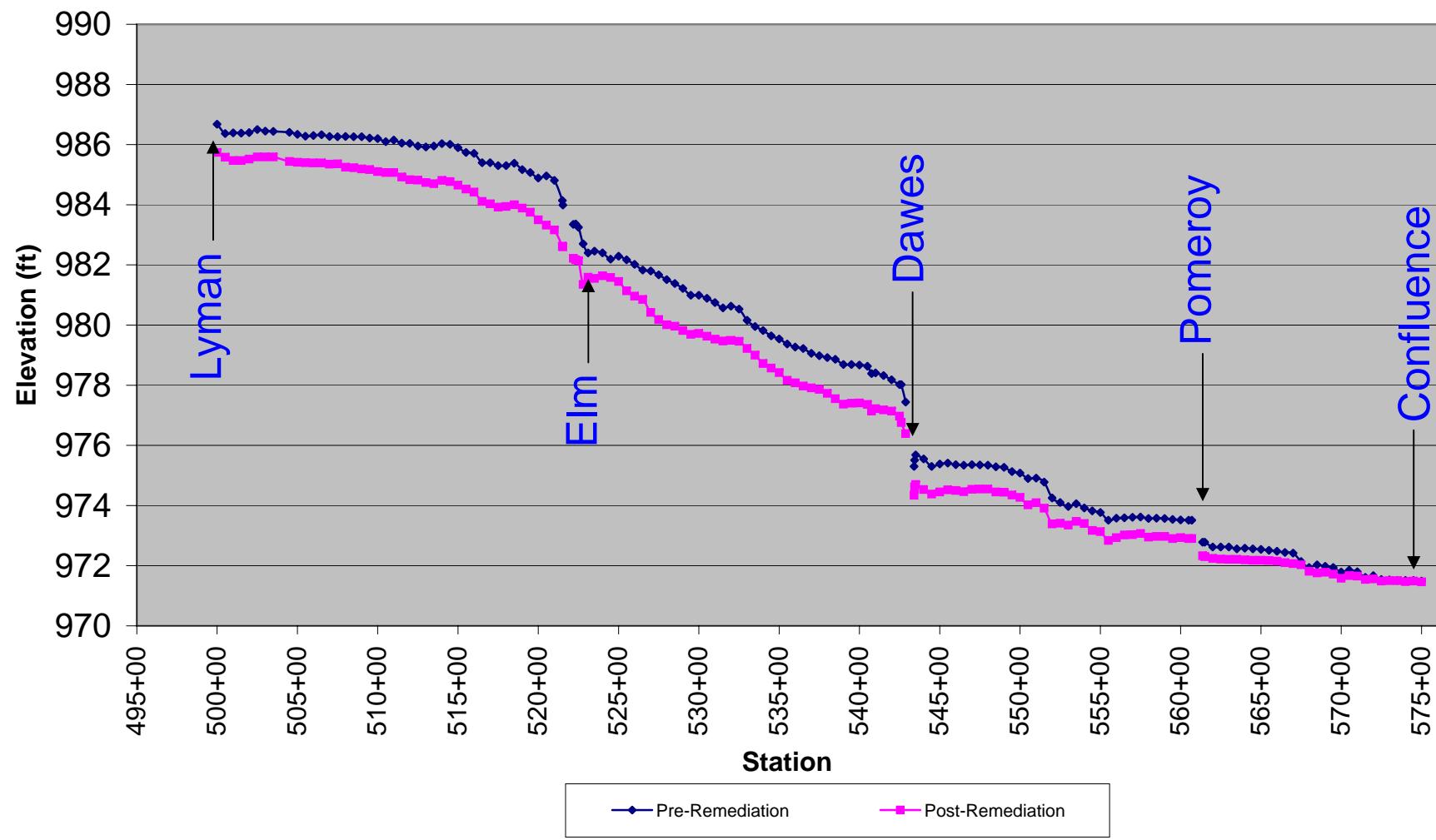


Figure 2E
Lyman Street to the Confluence
100-Yr Storm Event (8,721 CFS)
Pre-Remediation vs. Post-Remediation

